BIBLIOGRAPHY OF Technical Reports

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BIBLIOGRAPHY OF Technical Reports

March 13, 1953 Vol. 19, No. 3

CHEMICALS AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

Effectiveness of various drugs in prevention of air-sickness. IX: Protection of airborne troops, by Herman L. Chinn, W. R. Gammon, and M. E. Frantz. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Dec 1952. 5p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108321

Airborne soldiers received placebo or medication during two flights of 5 to 7 hours' duration. The incidence of vomiting for the placebo group was 6.8 percent. The following drugs given immediately prior to take-off significantly lowered the incidence of vomiting: Wellcome 47-83 (50 mg.), Phenergan (25 mg.), Phenergan (12.5 mg.), Trimeton (25 mg.), Pyrrolazote (50 mg.), and scopolamide (0.65 mg.). Postafene (50 mg.) given 24 hours prior to take-off also afforded significant protection. None of these medications was superior to the others. AAF SAM Proj. 21-32-014, Report no. 9.

Production and testing of pharmaceuticals. I. G. Farbenindustrie A. G. 1938-1941. 169f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.25, Enlargement Print $22.50. PB 74792

This reel contains reports chiefly on pharmaceuticals and their intermediates. Individual reports, available as enlargement prints, are listed below. Please give PB and frame numbers when ordering individual items. In German. FIAT Microfilm Reel N 96, Frames 670-6876).

Frames	Title	Price
6708-6726	Conclusion of Annual report, 1938.	$3.75
6727-6745	"Neostibosan." 1938	3.75
6746-6747	"Brenznatrium." 1938. Standardization.	1.50
6748-6756	Recent research on antimony preparations. 1938.	2.50
6757-6761	"Antimosan" powder. 1939.	1.50
6762-6765	Conferences on synthetic products as fillers for toothpastes. 1939.	1.50
6766-6790	Annual report, 1939. "Antimosan" powder, "Solustibosan," Filaria tests, esters of thioglycolic acid and similar substances, antimony compounds, arsenic-sulfamide compounds, etc.	5.00
6791-6802	"Solustibosan." 1941.	3.75
6803-6808	"Antimosan." 1941.	1.50
6809-6812	"Neostibosan." 1941.	1.50
6813-6836	Progress reports. 1939-1944. On thiazo-alcohol, vitamin D, aspirin substitute, hand disinfectant, etc.	5.00
6837-6838	High pressure hydrogenation. 1944.	1.50
6839-6840	The effect of ammonia on methoxyacetyl-acetone. 1939.	1.50
6841-6854	Progress reports. 1940-1941. Description of equipment, nicotinic acid ethyl ester, o-formic acid-triethyl ester, etc.	3.75

Frames	Title	Price
6855-6856	"Novantisol." 1938	$1.25
6857-6861	Experiments for producing the methyl and ethyl esters of 2-methyl-2-hydroxy-3-chloro-tetrahydrofuran. 1939	1.50
6862-6863	Report on acetyl-benzylamine. 1941.	1.50
6864-6667	Annual report, 1938. On "Aricyl," laxatives, etc.	1.50
6668-6869	Experiments for virus inactivation. 1942.	1.50
6870-6876	Light absorption and constitution of compounds with ethylene and azomethine bridge. 1939.	2.50

Agricultural Chemicals

Final report on Navy contract N6onr-27116, June 29, 1948-June 28, 1949. Columbia University, New York, N. Y. Report on Part A: Application of the Perrin theory to light scattering phenomena observed from sulfur hydrosols of various particle sizes, by Victor K. La Mer and Milton Kerker. Report on part B: Methods of forming, detecting and measuring the size and concentration of liquid aerosols in the size range of 0.01 to 0.25 microns diameter, by Victor K. La Mer, Edward C. Y. Inn and Irwin Wilson. Jun 1949. 67p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108355

1. Perrin theory (Light scattering) 2. Aerosols - Particle size - Measurement 3. Hydrosols, Sulfur - Light scattering 4. Light - Scattering - Theory 5. Light - Scattering - Measuring equipment.

Plastics and Plasticizers

Method of weatherproofing standard metal spectacle frames, by Wayne E. Gulley and J. Gordon Wells. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1952. 6p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108320

The simple field expedient of coating spectacle frames with a Plexiglaschloroform solution can be accomplished at most military installations. Under Arctic climatic conditions the one protective layer of plastic is superior to two or three additional layers and is also more satisfactory than the standard zyl frame. There is no deleterious effect to the one-layer plastic coating when taken from subzero to room temperature. A single layer of protective plastic coating on metal frames makes them comparable to the standard zyl frame under simulated tropical conditions. AAF SAM Proj, Special report.

Services, facilities and materials required for investigations and studies on synthetic resinous materials. Polaroid Corporation. Research Dept., Cambridge, Mass. Under Contract no. DA 36-039-sc-13. Project RC-18 Dept. of the Army project no. 3-93-00-500. Signal Corps project no. 32-2005-33.

Trimonthly progress report no. 1 (period Sep 1-Dec 1, 1949), by S. G. Cohen and M. S. Simon. Dec 1949. 25p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108161

The work during the first quarter has been largely preliminary in nature - definition of the problem, study of available information, elaboration of a program, acquisition of necessary materials, and initiation of the synthetic and casting aspects of the program. The synthesis of vinyl compounds has been worked out to the point where substituted styrenes, vinyl polynuclear hydrocarbons, and vinyl hydroaromatic compounds can be prepared readily. The crosslinking agent from the reaction between polyethylene glycol and allyl chlorocarbonate may be an interesting supplement to the hydrocarbon type - divinyl and diisopropenyl - crosslinking agents. The preliminary casting of the GR-S-styrene composition appears promising.

Trimonthly progress report no. 2 (period Dec 1, 1949-Mar 1, 1950), by S. G. Cohen and M. S. Simon. Mar 1950. 35p fold tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108162

1. Resins, Casting - Preparation 2. Styrene - Polymers - Production 3. Styrene - Copolymers - Preparation 4. Isoprene - Polymers - Preparation 5. Isoprene - Copolymers - Preparation 6. Butadiene - Polymers - Preparation 7. Butadiene - Copolymers - Preparation.

Trimonthly progress report no. 6 (period Dec 1, 1950-Mar 1, 1951), by S. G. Cohen and M. S. Simon. Mar 1951. 48p graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108166

Data on the electrical properties of resin C, which has been used to cast test circuits, resistors, capacitors, and 1/8 inch thick discs, are presented. Several catalysts systems were tested, as well as several resins which were investigated for heat resistance at 450°F. Chemical resistance was the subject of other tests.

Trimonthly progress report no. 9 (period Sep 1-Nov 30, 1951), by M. S. Simon. Nov 1951. 48p graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $2.50, Photostat $6.25. PB 108169

1. Resins, Casting - Preparation 2. Fillers (in plastics) 3. Resin C. 4. Copolymerization - Research 5. Polyisobutylenes - Uses 6. Resins, Butadiene.

Trimonthly progress report no. 10 (period Dec 1, 1951-Feb 29, 1952), by M. S. Simon. Feb 1952. 35p

graphs (1 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108170

1. Resins, Casting - Preparation 2. Resins, Synthetic - Research 3. Fillers (in plastics) 4. Resin C.

Trimonthly progress report no. 11 (period Mar 1-May 31, 1952), by M. S. Simon. May 1951. 41p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108171

1. Resins, Casting - Preparation 2. Resins, Synthetic - Research 3. Fillers (in plastics) 4. Resin C.

Paints, Varnishes and Lacquers

Electrets. Report no. 1 under Contract AF19 (604)-407, Jun 1, 1952 to Aug 31, 1952, by J. H. Rohrbaugh. New York University. Washington Square College of Arts and Sciences. Physics Dept. Sep 1952. 26p drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75.
PB 108219

A standardized method of preparing carnauba wax electrets to give fairly uniform electret strengths has been devised. To attain quantitative results it has been found necessary to avoid applying the field while the electret material is molten. A new method of charge measurement which permits measuring the charge of the electret without unshielding it at any time has been tried. Results are about the same as in the conventional method, which involves a temporary unshielding. Measurements on charge recovery of electrets after various types of discharge are being carried out. The method of discharging with iron filings shows some unexpected characteristics. The discharge currents of electrets under various conditions are being measured. All discharge current vs. time curves measured so far have been straight lines on loglog paper. The slope obtained depends on the discharge conditions.

Miscellaneous Chemicals

Action of lithium aluminum hydride on nitrate and nitrite esters, by Louis M. Soffer, Elizabeth W. Parrotta, Jewell Di Domenico. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Nov 1951. 6p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 108263

A number of organic nitrate and nitrite esters have been shown to react with lithium aluminum hydride in ether solution to give, after hydrolysis, essentially quantitative yields of the parent alcohol. The other products were nitrous oxide, ammonia and hydrogen. Nitrites produced relatively more nitrous oxide and less ammonia than nitrates. Cellulose nitrates of various degrees of nitration were completely denitrated in tetrahydrofuran. Viscosity measurements indicated extensive degradation of the polymer had occurred. Project no. TB3-0110 of the Research and Development Division, Ordnance Corps. APG BRL R 792.

Determination of thorium in monazite ores by measurement of radioactivity, by L. F. Audrieth and A. G. Buyers. Illinois. University, Urbana, Ill. Dec 1947. 45p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25.
PB 108154

A method was developed for the determination of the thorium dioxide content of certain monazite ores, specifically those obtained from Brazil and India, which depends upon measurement of radioactivity of such materials. A conventional Geiger-Mueller setup was used, the experimental procedure is described, and results are discussed in detail. It is suggested that the procedure may be useful as an aid in prospecting for deposits of monazite, in the determination of the boundaries of such deposits, and in the evaluation of the effectiveness of various physical procedures which may be employed for enriching and for concentrating ore materials. Solutions of thorium salts were also assayed by measurement of radioactivity and the experimental procedure is described. Results are also presented of analyses made on samples of unknown origin of monazite ore. Contract N6ori-71, Chemistry task VII. Based on a thesis submitted by A. G. Buyers to the Graduate School of the University of Illinois.

Diffusion of N_2O_4 in CCl_4, by Frederick Kaufman and Verna Fiora. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Dec 1951. 10p drawing Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 108258

The diffusion of NO_2, N_2O_4 equilibrium mixtures in carbon tetrachloride was studied by the sintered glass diaphragm method. The diffusion coefficient of N_2O_4 was determined at 25, 35, and 50°C and it was shown that the effect of NO_2 which is present only at low concentration is too small to be observable experimentally. This in agreement with calculations assuming reasonable physical parameters and defines an approximate upper limit for the diffusion coefficient of NO_2. Project no. TB 3-0110 of the Research and Development Division, Ordnance Corps. APG BRL M576.

Heat flow and diffusion in the chemical reaction of a finite solid with a gas. Part I: Exothermal, first-order reaction which consumes the gaseous reactant, by B. L. Hicks, W. W. Widule, J. Schwartz. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Apr 1952. 40p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00.
PB 108264

Project no. TB3-0110 of the Research and Development Division, Ordnance Corps.
1. Gases - Reactions - Thermal effects 2. APG BRL R804.

Investigations of rare earth problems. Illinois. University, Urbana, Ill. Contract N6ori-71, Chemistry task no. VII.

Quarterly progress report no. 5, Jun 1, 1947 to Sep 1, 1947. Sep 1947. 32p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108211

The investigations of rare earth problems were continued as pertains to analytical, ion migration, exchange reaction studies, reduction to the divalent state, and separation of the rare earths by thermal diffusion. Analytical studies included the recovery of rare earth elements and thorium, and spectrophotometric estimation of the rare earths. Ion migration studies included experiments to determine the feasibility of the "counter-current ion migration" method as a means of separating or concentrating rare earth ions. Exchange reaction studies were concerned with systems involving thorium and rare earth metal ions. Reduction of rare earths to the divalent state encompassed polarographic studies, and reduction to the divalent state with strontium amalgam. Separation of rare earths by thermal diffusion was made using the chlorides of neodymium and praseodymium.

Quarterly progress report no. 7, Dec 1, 1947-Mar 1, 1948. Mar 1948. 42p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108208

Continued investigations of the absorption spectra of gadolinium salt solutions indicate lack of rigid adherence to Beer's Law. Analyses to within +10% are the best which can be reported. An examination of the effects of added anions upon absorption spectra of the rare earth elements has been started. Ion-exchange studies have demonstrated the feasibility of effecting separation of neodymium from thorium by preferential elution of the former with buffered hydrochloric acid solution. Reduction of the rare earths to divalence included polarographic studies and amalgam reduction. Work was concluded on separation of thorium from the rare earths by solvent extraction. The nitrate fusion method of concentrating praseodymium has been studied as a means of obtaining high purity materials in appreciable quantities. An investigation of the phosphoric acid derivatives of the rare earths is being undertaken.

Observations on the rare earths: Ion exchange studies on thorium-rare earth mixtures, by Therald Moeller and Arthur Ralph Matheson. Illinois. University, Urbana, Ill. May 1948. 56p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108206

In connection with ion exchange studies on thorium-rare earth mixtures, a cation exchange resin, Amberlite IR-100H, was used to determine if thorium and neodymium ions could be separated from each other by this means. The preparation of solutions and the analytical methods used are described, and the action of various eluting agents is discussed. Various substances were found to be capable of effecting a separation of thorium ions from neodmium ions, namely, 0.5% and 5% hydrochloric acid solutions, in the pH range 2.60-2.88; saturated ammonium carbonate solution, pH 8.56 saturated ammonium oxalate solutions, pH 5.15, 6.28, and 8.70. The pH of the solutions used as eluting agents is very important in effecting any elution and separation. Contract N6-ori-71.

Observations on the rare earths: Studies in ion exchange, by Arthur Edwin Taylor. Illinois. University, Urbana, Ill. Feb 1950. 60p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108210

Rare earth studies involving ion exchange phenomena are presented with particular reference to the separation of thorium and the rare earths by ion exchange procedures. An attempt is made to determine the effect which the variation of certain factors (pH, concentration of the complexing agent and total ionic strength of the solution, type of resin and resin mesh size, mass of rare earth per unit area of cross section, flow rate, column length, and temperature) has upon the separation of the members of the cerium group of the rare earths. Apparatus and materials, preparation of reagents, analytical procedures, and exchange experiments are discussed in detail. Data from experiments with exchangers amberlite IR 100-H, and Dowex-50 are furnished. The various conclusions are listed, and graphical data is provided. Contract N6ori-71, Chemistry task no. VII.

Report on a survey of chemical literature dealing with fluorine-containing organic compounds, by William F. Arey, Jr., W. T. Dye, Jr., John A. Krynitsky, L. B. Lockhart, Harry B. Miller, S. B. Knight, E. C. Markham, Arthur Roe, Sherman E. Smith. North Carolina. University. Dept. of Chemistry. Jun 1943. 408p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $51.25. PB 108145

NRL Contract no. N173S-4650.
1. Fluorine compounds - Bibliography 2. Fluorine compounds - Organic - Research.

Separation of rare earths by ion exchange, by Therald Moeller and Donald D. Starr. Illinois. University, Urbana, Ill. n.d. 49p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108209

Research on the behavior of rare earth ions in exchange reactions is described. The materials and methods of analysis are discussed, and ion exchange studies in both static and dynamic systems are outlined. The equilibria of 0.1 M solutions of yttrium,

lanthanum, and neodymium nitrates with Amberlite IR-100H, Zeo-Karb Na, and Super Zeo-Dur Na were found to be nearly alike. The order of the removal of several rare earth ions from an ion exchange column by selective elution with critic acid elutriants was found to be yttrium, neodymium, cerium, lanthanum, corresponding to the order of increasing crystal radii. It was found that rare earth oxalates could be dissolved by boiling a slightly acid aqueous suspension of the oxalate with ammonium peroxydisulfate. Contract N6ori-71, Chemistry task no. VII.

ELECTRICAL MACHINERY

Communication Equipment

Input circuits for high-fidelity crystal-video receivers, by William E. Ayer. Stanford University. Electronics Research Laboratory, Stanford, Calif. Jul 1952. 31p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108233

This report treats the use of physical and electronic loading of the input circuit of crystal-video pulse receivers, the purpose of the loading being to improve the pulse-width fidelity of the system. Expressions for sensitivity and rise time are derived for both types of loading. It is shown that a simple grid-to-plate feedback circuit can be used to provide almost any desired input loading for only a small loss in sensitivity. With heavy physical loading, on the other hand, a considerable sacrifice in sensitivity is made. Also considered are several practical problems which have been encountered in the construction of video-crystal input circuits. Perhaps the most important of these is the excess low-frequency noise produced by composition and similar resistors. The considerable loss in sensitivity due to this source can be remedied by using wire-wound resistors in those portions of the input-stage signal circuits carrying direct current. Contract Nonr 225 (10) (NR-377-366). Technical report no. 1. SU ERL TR1.

Portable radio assault beacon, prepared by Samuel J. Snyder, by Raymond M. Wilmotte. Aug 1944. 62p photos, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108185

This report describes a study made leading to the development of a radio beacon designed to guide an infantryman to an objective for a distance of 2500 yards using equipment already available in the field, without requiring any internal modifications. This report briefly analyzes various types of beacons available, the reason for selection of frequency and modulation, and the sources of error in the two types of beacon which were found to be most satisfactory. One of these types of beacon, described in a British report, uses two Beverage antennas set at 45 degrees to the desired course. Three units for this type of beacon were delivered under this contract for field tests. The other type of beacon that was found capable of good results was a modification of this British type. It provided certain advantages but was slightly more complicated. Contract no. OEMsr-1261, Final report. Report no. 311. NDRC Div 13. OSRD 4058.

Radio set AN/PRC-6. U. S. Army. Oct 1951. 38p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108157

Basic issue.
1. Radio operation 2. Radio - Maintenance and repair 3. Radio - Storage 4. AN/PRC-6 (Radio) 5. WD TM 11-296.

Radio transmitters, receivers and transceivers. Lorenz, C., A. G., Berlin. 1941-1944. 623f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $82.50. PB 73976

This FIAT microfilm reel consists of manuals for radio transmitters, receivers and transceivers manufactured by the C. Lorenz A. G. for the German Army. Individual items will be available as enlargement prints only; the entire reel may be purchased in microfilm form for $9.00. Please include PB and frame numbers when ordering individual items from this microfilm reel. In German. FIAT Microfilm Reel B 320, Frames 705-1327.

Frames	Title	Price
705-757	Transmitter "Lo 800 FK 36." 1944. Manual containing descriptions, technical data and operating and service instructions of this 800 watt marine short-wave radio apparatus. Photographs, circuit and wiring diagrams and parts lists included.	$8.75
758-779	200 watt long- and short-wave transmitter with power supply. 1944. In German. Manual containing description, operating and servicing instructions, photographs and circuit diagrams.	5.00
780-809	Transmitter "Lo 200 L 36." 1944. In German. Description, operation and servicing instructions, parts lists and wiring and circuit diagrams.	5.00
810-823	General description and operating and service instructions of the modulator for all 200 and 800 watt marine transmitters of the 1937 type. 1942. In German. Photographs, circuit and wiring diagrams.	3.75
824-836 881-914	Frequency meter type ZS 68772 for marine transmitters. Parts 1 and 2. 1941. In German. Technical data, operating instructions, parts lists and diagrams.	3.75

Frames	Title	Price
837-855	Watercraft of the German air forces with radio equipment FuG 10, FuG 10P, FuG 16, FuG 141, Peil G5, Fud 2, radio broadcast receiver 740 G.W. ER2. 1942. In German. General handbook with references as to where detailed data on the radio equipment may be found.	$3.75
856-880	5 Kwatt transmitter "Lo 5000 L 41," frequency ranges 94.5-191 kc, 189-382 kc, 387-764 kc. 1944. In German. Description, operating and service instructions and parts lists.	5.00
915-1104	Handbook for "Freya" radar equipment FuMg 401. 1944. In German. Purpose, technical data, operating instructions and detailed description of all parts, including parts lists, drawings and circuit and wir ng diagrams, with explanations.	25.00
1105-1145	200 Watt marine short-wave transmitter, including single-phase rectifier supply and frequency meter. 1943. In German. Description, technical data, operating and service instructions, photographs, circuit and wiring diagrams and part lists.	6.25
1146-1201	Transmitter "Lo 800 L 36." 1944. In German. Complete manual of the 800 watt marine long-wave equipment.	8.75
1202-1263	Airborne transceiver FuG 16. 1943. In German. Complete manual of the ultrahigh-frequency equipment used aboard aircraft of the German air forces. Frequency 38 to 43 megacycles.	10.00
1264-1293	Airborne transceiver FuG 10 K3. 1943. In German. Complete manual of the short-wave carrier telegraph and radio telephone equipment covering frequency range from 3 to 8 megacycles.	5.00
1294-1307	Airborne transceiver FuG 25A. 1943. In German. Description and operating instructions of the 300 watt ultrahigh-frequency equipment. Photographs, parts lists and wiring and circuit diagrams included.	3.75
1308-1327	Short-wave marine receiver "Lo 6 K39a" for frequencies from 1500 to 2500 kc. 1944. In German. Manual.	3.75

Rectification of a sinusoidally modulated carrier in random noise, by David Middleton. Harvard University. Cruft Laboratory. Jul 1948. 55p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108401

The low-frequency output, signal and noise, is determined following a general νth law ($\nu > 0$), half-wave rectification of a sinusoidally modulated carrier. The spectral width of the noise before rectification is assumed to be much narrower than its mean frequency f_o, the normal condition for reception. Attention is focused on one of the harmonics of the rectified signal, generally the first, whose modulation frequency is small compared to the intermediate frequency f_o and to the width of the noiseband. Special attention is given to the important cases of linear ($\nu = 1$) and quadratic ($\nu = 2$) detection, and audio signal-to-noise rations s_a/n_a are calculated for them. The noise passed by the audio filter is found to depend on the spectral shape of the IF; for the three types of IF filter specifically considered, namely, rectangular, Gaussian, and "optical," the optical yields the least, the rectangular the most noise, provided, of course, that the mean input signal-to-noise power p is of the order of unity or less, the customary region of interest. Modulation ($0 \leq \lambda \leq 1$) does not radically affect the output noise power, particularly when p is large (> 1). All ν th law detectors exhibit quadratic behavior when $p \ll 1$, and for very large signals, $p \longrightarrow \infty$, s_a/n_a is directly proportional to the input carrier amplitude, is independent of IF filter width, and is only slightly dependent on filter shape. The best IF filter is one whose response is the modulus of the Fourier transform of the signal as in the radar case of pulsed signals (Reference 1). The theory is in good agreement with the experimental results for the linear rectifier, and numerous theoretical curves illustrating the variation of the audio radio s_a/n_a with p and λ are also included. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 45.

Studies, investigations, and applied research concerning radio interference instrumentation, development of pickup devices and evaluation of electro-medical equipments period 1 Sep 1952 to 30 Sep 1952 under Contract no. NObsr-52386, by Richard B. Schulz. Electro-Search, Philadelphia, Pa. Oct 1952. 34p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108284

This report describes all work performed under the contract. Work performed on electro-medical equipment has already been reported in detail and is only summarized herein. The development of pick-up devices and radio-interference instrumentation is reported in detail herewith. Conclusions are drawn from the work and recommendations are presented. For other reports under this contract see PB 107102, 107114, 107208-107211, 107213-107217, 107231, 108283.

Traveling-wave tube (discussion of waves for large amplitudes), by L. Brillouin. Harvard University. Cruft Laboratory. Feb 1949. 39p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108460

The traveling-wave amplifier is a typical structure where E-M waves and electrons, traveling with approximately the same velocity, exhibit a strong interaction. The problem has usually been discussed for the case of weak waves with approximations

corresponding to a small signal theory. It is interesting to state the limitations of this theory and to discuss the behavior of such tubes for strong signals. It seems that the amplified wave obtained in the case of small signals is progressively distorted until a final stage is reached where no further amplification is possible. The type of final distorted wave depends essentially upon all the details of the structure. In many cases where a complete investigation was possible, some strange types of shock waves were obtained, with a complete bunching of the space-charte. A similar solution also applies to the linear accelerators or to the synchrotrons. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR68.

Electronics

Application of a variational principle to the study of biconical antennas, by C. T. Tai. Harvard University. Cruft Laboratory. Mar 1949. 30p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108463

A theoretical examination is made of the impedance of a biconical antenna, based upon a method devised by Schwinger in studying the discontinuity problems of a waveguide. In the present analysis, an integral equation to determine the aperture field is obtained by matching the tangential electric and magnetic fields along the boundary sphere. Using this integral equation, the effective terminating admittance of the antenna can be expressed in a form that is stationary with respect to small variations in the aperture field. It is shown that the zeroth-order solution of the admittance function thus obtained is the same as the one that Smith derived by neglecting all the high-order approximate solution which is applicable to both small- and wide-angle cones. The analysis includes a detailed treatment of the method by which the characteristic values and characteristic values and characteristic functions for a given cone may be found approximately, but very accurately; as well as certain integrals involving the product of Legendre functions. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR75.

Bibliography of reports on tropospheric propagation. Final report, part 1, by William E. Gordon, Lorne H. Doherty and Bob M. Fannin, assisted by Pier L. Bargellini, Francis T. Cole, Te-Jen Koo, Norbert Rosenzweig, John R. Townsend, George T. Trammell and Samuel A. Ward. Prepared under U. S. Air Force Contract AF (038)-1091, Expenditure Order no. 112-73. Cornell University. School of Electrical Engineering, Ithaca, N. Y. Apr 1952. 388p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $48.75. PB 108151

Bibliographies of domestic and foreign works are presented. They deal with standard atmospheric propagation, nonstandard atmosphere propagation - pure theory, nonstandard propagation experiments - experiments and theory, propagation experiments, meteorological theory, meteorological experiments, meteorological equipment, radar forecasting, atmospheric absorption and scattering, dielectric constant and loss factor, reflection coefficient, horizontal and vertical polarization, and effect of trees, hills, obstacles, etc.

Colloquium on transistors in theory and practice. U. S. Naval Research Laboratory. May 1952. 40p diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111086

Three papers were presented at the Colloquium on Transistors in Theory and Practice held at the Naval Research Laboratory on 21 May 1952. The first paper was on the solid-state physics underlying transistor operation; the remaining papers dealt with the application of transistors to cw and pulse circuits. Contents: Introductory remarks, by Allen Schooley. - Electron and hole phenomena in transistors, by Elias Burstein. - Application of transistors to radio receiver circuitry, by Emerick Toth. - Use of transistors in switching circuits, by Darrin Gridley. NRL R 4049.

Diffraction by a cylindrical obstacle, by Charles H. Papas. Harvard University. Cruft Laboratory. Jun 1949. 30p diagrs, graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108467

The diffraction of a plane electromagnetic wave by an infinitely long, perfectly conducting cylinder has been treated by a variational method (see the two papers by H. Levine and J. Schwinger [1,2]). The incident field is assumed to be polarized in the direction of the cylinder axis, and thus the entire field is of two-dimensional nature. This formulation yields an expression for the diffracted cylindrical wave-amplitude, at distances from the cylinder large compared to its transcrese dimension and the wavelength, which is stationary relative to small independent variations of the surface currents arising from plane-wave excitation along a pair of directions in space; furthermore, the stationary form of the diffracted amplitude is independent of the scale of the surface currents. In accordance with a theorem (Ref. 1, p 963-964) the total plane-wave scattering cross section is simply related to the diffracted cylindrical wave-amplitude in the direction of incidence. To examine the high-frequency behavior of the cross section, the surface current induced by a plane wave is taken different from zero only on the illuminated part of the cylinder, where its value is derived from the tangential component of the incident magnetic field. The resulting cross section is obtained and is shown to approach 4a when ka approaches infinity ($k = 2\pi/\lambda_0$, λ_0 wavelength, a equals the radius of cylinder). Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR83.

K-band germanium crystals. General Electric Co., Schenectady, N. Y. Bimonthly progress report, Aug 15-Oct 15, 1944, under Contract OEMsr-1377, by H. I. North. Oct 1944. 2p drawing Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108183

For final report see PB 5206. Work continued under Contract OEMsr-262. For final report under this contract see PB 105586.
1. Crystals, Germanium 2. Radar - Band K 3. Germanium - Purification 4. NDRC Div 14-328.

Measurement and interpretation of antenna scattering, by D. D. King. Harvard University. Cruft Laboratory. Jul 1948. 36p photos, diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108409

The significance of scattering cross section and back-scattering cross section in terms of antenna current distribution is considered. Description is given of a measuring scheme utilizing standing waves which permits the detailed study of back-scattering from loaded and unloaded antennas. Approximate scattering data for several types of antennas are included. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR50.

Mechanical shock characteristics of high impact machines for electronic devices (Taft-Peirce manufacture), by Irwin Vigness, Richard C. Nowak, Erwin W. Kammer. U. S. Naval Research Laboratory. Dec 1946. 50p photos, drawings, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108155

High impact shock machines have been used extensively in testing equipment designed for shipboard use. The data show that for corresponding settings these machines do in practice deliver substantially equal shocks and so may be used interchangeably. A comparison is made with three other machines of the same basic design, each from a different source and each having some small changes in design. These three exhibited differences among themselves. The higher accelerations at high frequencies of the latter are ascribed to a more rigid construction of the shock table. The effect of this difference in construction could not be counterbalanced by changes in setting. Simple approximations were found to express the maximum acceleration as a function of the angle through which the striking hammer had swung. Expressing the maximum acceleration as a multiple of the acceleration of gravity and the angle of hammer swing in degrees, the relations are as follows: Steel hammer, maximum acceleration = 15 times angle of swing. Aluminum hammer, maximum acceleration = 12 times swing. The shock table attains a velocity in feet per second of about 0.1 times the number of degrees through which the hammer falls if the steel hammer is used, and half this value if the aluminum hammer is used. This velocity is attained in about 3/4 millisecond. NRL 0-2838.

Microwave properties of precipitation particles, by J. S. Marshall, T.W.R. East and K.L.S. Gunn. McGill University. MacDonald Physics Laboratory. "Stormy Weather" Research Group. Jul 1952. 44p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108230

The back-scatter and attenuation of microwaves by spherical particles can be computed exactly from formulae first derived by Mie. Using these formulae with the measured characteristics of rain showers, the empirical relation has been found that attenuation by rain is proportional to rainfall rate R (as suggested by Ryde) at 10 cm and at 9 mm wavelength, but to $R^{1.3}$ at 3 cm wavelength. The much simpler "Rayleigh" approximate formulae can be applied to both back-scatter and attenuation in the case of clouds, and to back-scatter from rain at wavelengths 1.7 cm and longer with fair approximation. A small ice sphere coated thinly with water will scatter nearly as well as a water sphere of the same volume, and may absorb better. A small water spheroid would scatter and absorb more strongly than a water sphere of the same volume by factors which reach 80 or more for extreme shapes. Making the assumptions (1) that large spheroids have shape factors similar to those for small ones, and (2) that a water coating makes an ice spheroid behave like a water spheroid of the same size and shape, a water coating on ice clouds and snow must make them behave like water clouds and rain with shaped drops. Then the scattering by melting snow will be greater than by the resulting rain, and attenuation in wet snow or by water-coated ice clouds will exceed considerably that in rain or water cloud. Suitable experiments should show whether these conditions exist in the "bright band". Contract no. AF-19(122)-217. Scientific report MW-7.

New type safety interlock switch, by D. Satinoff. U. S. Air Force. Rome Air Development Center. Electronic Development Div., Griffiss Air Force Base, Rome, N. Y. Aug 1951. 20p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108224

The development of a new type safety interlock switch is presented. This report includes an exposition of existing types of switches, their limitations, deficiencies, and hazards to the safety of the operating personnel, and a discussion of the design improvements incorporated in the new type of switch. AAF RADC TR 6375.

Note on the effect of a video filter on the detection of pulsed signals in noise, by David Middleton. Harvard University. Cruft Laboratory. Aug 1948. 30p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108416

The effects of inserting a video filter of finite width on the observability of pulsed signals in random noise are examined. It is found that at mach (when the pulse and IF filter are each other's conjugate Fourier transforms) no improvement is gained from such a video: the infinitely wide response yields the optimum results. This is strictly true when the second detector is a quadratic rectifier; (a slight improvement on narrowing the video is noted, however, for strong signals when a half-wave linear rectifier is used). Away from match a video filter does give noticeable improvement when the pulses

are overlong, i.e., narrower spectrally than the IF ($\lambda > 1$); more noise than signal is then removed by the narrower video filter. The greatest gain over the infinite video is observed for final filters slightly wider than the original pulse. On the other hand, for pulses that are too short ($\lambda < 1$) the performance is worsened. The mean maximum signal level is decreased more rapidly than the interfereing noise background. In all instances the familiar phenomenon of modulation suppression arises. Two different pulse shapes are considered: (1) gaussian and (2) rectangular, but for wide videos pulse shape is not a critical factor. Curves showing the putput signal-to-noise ratios as a function of the input ratio are included for conditions of match ($\lambda = 1$) and mismatch ($\lambda \neq 1$). Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR57.

Nuclear magnetic moment of S^{33} from microwave spectroscopy, by J. R. Eshbach, R. E. Hillger, M.W.P. Strandberg. Massachusetts Institute of Technology. Research Laboratory of Electronics. Dec 1951. 19p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108130

The magnetic dipole moment of the S^{33} nucleus was determined by means of the Zeeman effect on the hyperfine pattern of the $J = 1 \longrightarrow 2$ rotational absorption of the molecule $O^{16}C^{12}S^{33}$ at about 24,020 Mc/sec. The result is $\mu(S^{33}) = +0.633 \pm 0.010$ nuclear magnetons. The sign of this moment was determined by using circularly polarized microwave radiation with σ -type Zeeman observations. The frequencies of all of the components of the hyperfine pattern were measured. They all fit the nuclear electric quadrupole coupling theory to within ± 0.01 Mc/sec. The measured value for eqQ of the S^{33} nucleus in $O^{16}C^{12}S^{33}$ is $eqQ\ (O^{16}C^{12}S^{33}) = -29.07 \pm 0.01$ Mc/sec. Contract no. DA 36-039-sc-100. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 8-102 B-O. MIT RLE TR 224.

On radiation and radiating systems in the presence of a dissipative medium, by C. T. Tai. Harvard University. Cruft Laboratory. May 1949. 34p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108464

This report gives a summary of some results that have been obtained on the problem of radiation and radiating systems in the presence of a dissipative medium. It contains first a review of the propagation of electromagnetic waves across the boundary of two media, one of which is dissipative. Radiation from a Hertzian dipole is then discussed. The theory of a cylindrical antenna placed in a dissipative medium is next treated using the vector potential method. Finally, a detailed analysis of some insulated radiating systems is given which is based upon certain recent developments in the theory of biconical antennas. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR77.

On the infinitely long cylindrical antenna, by Charles H. Papas. Harvard University. Cruft Laboratory. Sep 1948. 26p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108417

By means of a Green's function an exact integral expression is derived for the distribution of current along an infinitely long cylindrical antenna excited by a localized electromotive force. Using the method of steepest descents, the far field and the asymptotic form of the current distribution at large distances from the source of excitation are obtained. The low frequency value of the radiation conductance is determined by integrating the radiated energy flux over a large sphere. This value agrees with those of previous investigators. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR58.

Precipitation trajectories and patterns, by J. S. Marshall, M. P. Langleben and E. Caroline Rigby. McGill University. MacDonald Physics Laboratory. "Stormy Weather" Research Group. Aug 1952. 26p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108231

A characteristic "mares' tail" pattern of falling snow (observed in vertical section by radar) suggests that the snow is generated continuously in compact generating elements; the pattern results from the snow falling at constant velocity through the wind shear. For constant wind shear, the snow trails are parabolic, and before reaching the ground become almost horizontal. The velocity of the pattern is that of the generating elements, and can be compared with wind strengths aloft to locate the height of the generating elements when these elements are not detected by the radar. Contract no. AF-19(122)-217. Scientific report MW-8.

Principles of crystal rectifiers, by F. Seitz and S. Pasternack. Pennsylvania. University, Philadelphia, Pa. Jun 1942. 41p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108184

The purpose of this report is to present in a qualitative fashion the elementary principles of crystal rectification as applied to frequencies below the microwave range. Contract OEMsr-388. NDRC 14-102.

Properties of long antennas, by Erik Hallen. Harvard University. Cruft Laboratory. May 1948. 27p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108400

Although exact integral expressions for the outgoing current waves on a long antenna have long existed, they have never been brought into such form that a

numerical or graphical description of the wave has been possible. The author shows how to transform them into good series expansions valid for all distances from the feeding point. Graphs show the result. The traveling current waves can also be extracted from the author's expression for the current on a finite transmitting antenna published in Nova Acta Upsal, 1938. Both ways give identical series. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR44.

Radiation from a transverse slot in an infinite cylinder, by Charles H. Papas. Harvard University. Cruft Laboratory. Oct 1948. 31p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108419

The radiation field from a single thin transverse slot cut on an infinite cylinder is determined by means of a suitable Green's function and the application of Green's identity. Use is made of an assumed distribution of electric field over the slot. Polar diagrams of the radiated field are presented. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR61.

Study of the EMF method, by C. T. Tai. Harvard University. Cruft Laboratory. Jul 1948. 28p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108414

The present work contains an investigation of the EMF method to determine the input impedance of a thin biconical antenna as first suggested by Schelkunoff. By considering the various components of the currents flowing on the antenna, it has been shown that the sinusoidal part is, indeed, the dominating component among all these currents. An investigation of the total current at the end of the antenna, where the lateral surface of the cone and the spherical cap meet, shows that the current is not identically zero there, but vanishes as the reciprocal of the square of the characteristic impedance of the cone. The two approximate expressions of the complex conjugate power used in the EMF method are derived, as well as the exact expression. Computation of some integrals occurring in the formulation is also treated in detail in order to show the various approximations involved. The delicacy of the method is finally pointed out. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR55.

Surface structure of quartz crystals, by George W. Arnold, Jr. U. S. Naval Research Laboratory. Oct 1952. 18p photos, diagrs, graph Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111084

The single crystal spectrometer shows rough ground quartz surfaces to be misoriented up to 8°; polished surfaces 30 to 45 minutes; etched surfaces from 30 to 60 minutes depending upon etching time. The method is unsatisfactory except as a means of comparison because the results are strictly dependent upon time of exposure to the X-ray beam. The Laue transmission method utilizes the density and width of split Laue spot segments for the comparative determination of degree of misorientation and depth of disorder. For the very thin crystal plates being studied, diffraction spots at wide angles from the primary beam must be used to resolve the separate parts of the spot. Kikuchi line patterns indicate a high degree of crystalline perfection; cross-grating patterns show distortion to be present. Etching experiments on a rough ground crystal show most of the distorted material is removed at a depth of approximately 1/20 micron. NRL R 4065.

Theory of N-coupled parallel antennas, by R.W.P. King. Harvard University. Cruft Laboratory. Jun 1949. 33p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108468

The integral-equation theory of coupled antennas developed by King and Harrison, Tai and Bouwkamp for two- and three-coupled antennas is generalized to any number of units symmetrically arranged around a circle. The case of four antennas at the corners of a square is discussed in detail. Application to cage and corner-reflector antennas is indicated. The analysis of N parallel antennas arranged in line is carried out to determine the driving voltages required to maintain specified currents. It is shown that the inverse problem cannot be carried out in general except as a problem in simultaneous integral equations, but that the special conditions obtaining for half-wave dipoles permit as approximate analysis for the currents with given voltages. This is carried through. Contract N5ori-76, Task order no. 1, NR-078-011. NU CL TR84.

Traveling waves and unsymmetrically fed antennas, by Erik Hallen. Harvard University. Cruft Laboratory. Jun 1948. 58p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108408

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Antennas - Theory 2. Antennas - Currents
3. Waves, Traveling - Theory 4. HU CL TR 49.

Generators, Motors, Transmission

Central research laboratory reports on electrical engineering, 1929-1947. Siemens & Halske A. G., Berlin. 1929-1947. 723f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $95.00. PB 83378

This FIAT Microfilm reel consists of a card index of scientific and industrial reports prepared by members of the Siemens & Halske central laboratory and of 49 such reports as listed below. Individual items will be available as enlargement prints only; the entire reel may be purchased in microfilm form for $9.00. Please include PB and frame numbers when ordering individual items from this microfilm reel. In German. FIAT Microfilm Reel B 367, Frames 1-718.

Frames	Title	Price
1-348	Card index of industrial and scientific papers on research made in the Siemens & Halske central laboratory from 1929 to 1947 arranged alphabetically by names of authors. In German.	$46.25
349-350	Report on conference held in regard to the development of a television system. 1946. In German.	1.50
351-352	Report on tests with four selenium rectifiers. 1946. In German.	1.50
353-363	Report on eddy current compensation in coils. 1946. In German.	2.50
364-371	Office memorandum on extension of the band-pass width of several short-wave receivers. 1946. In German.	2.50
372-378	Report on the calculations for a slide variometer with iron core. 1946. In German.	2.50
379-381	Report on the development of an all-wave receiver. 1946. In German.	1.50
382-388	Report on a voltmeter for radio equipment covering frequencies from 125 to 280 kc. 1946. In German	2.50
389-395	Report on a frequency meter for 1 to 20 megacycles. 1946. In German.	2.50
396-404	Report on a frequency meter for 1 to 6 megacycles. 1946. In German.	2.50
405-407	Office memorandum on a device for the determination of nonlinearity of microphones and loudspeakers. 1946. In German.	1.50
408-415 421-436	Memorandum on a new bridge circuit for impedance measurement. 1946. In German.	5.00
416-420	Report on a device for recording characteristics of radio devices. 1946. In German.	1.50
437-463	Calculation of nonlinear distortion of a sinus wave. 1946. In German.	5.00
464-469	Report on carbon resistors. 1947. In German.	1.50
470-475	Report on production of low resistors of polished silver wire. 1946. In German.	1.50
476-485	Memorandum on conductivity of vaporized selenium layers. 1947. In German.	2.50
486-491	Report on tests with carbon resistors. 1946. In German	1.50
492	Report on piezoelectric crystal production. 1946. In German.	$1.50
493-495	Work on infrared devices. 1946. In German.	1.50
496-519	Photoelectric counting devices. 1946. In German. Review.	5.00
520-526	Memorandum on a directional capacitor microphone. 1946. In German.	2.50
527-531	Report on growth of Seignet salt crystals. 1946. In German.	1.50
532-533	Report on the construction of a telephone station. 1946. In German.	1.50
534-550	Report on magnets for DKE loudspeakers. 1946. In German.	3.75
551-561	Memorandum on magnetic materials for microphones. 1946. In German.	2.50
562-564	Memorandum on distortion of telegraph signals. 1947. In German.	1.50
565-569	Report on new semiconductors. 1939. In German.	1.50
570-589	Reports on the production of pyroelectric conductors. 1941-1944. In German.	3.75
590-591	Report on a conference in regard to ceramic capacitors. 1946. In German.	1.50
592-607	Memorandum on the production of a new transformer T. tr. 15. 1944. In German.	3.75
608-617	Report on dimensioning of a 150 cycle series resonant circuit. 1944. In German.	2.50
618-622	Report on the characteristics of choke-evils Röh. tr. 1 + 3. 1944. In German.	1.50
623-625	Report on magnetic materials. 1946. In German.	1.50
626-635	Contact converters. By O. Römer. 1946. In German.	3.75
636-643	A new wide band-pass system for telephony and television. 1940. In German.	2.50
644-652	A 12-channel system using loaded cables with repeater stations 70 km apart. 1942. In German.	2.50
653-655	Pupinized "Styroflex" cables for frequencies up to 60 kilocycles. 1942. In German.	1.50

Frames	Title	Price
656	Memorandum on the construction of a new telephone system. 1942. In German.	$1.50
657-668	Nonlinearity of ferromagnetic bodies at two sinus waves. 1943. In German	3.75
669-679	Distribution of peak and minimum voltages in telephone networks. 1943. In German.	2.50
680-682	Report on materials for powdered iron cores for loading coils. 1946. In German.	1.50
683-685	Report on transformer core production. 1946. In German.	1.50
686-691	Report on frequency divider from 50 to 25 cycles for purposes of telephony. 1946. In German.	1.50
692-699	Development of a machine for varnishing thin capacitor papers. 1943. In German.	2.50
700-704	Report on the development of quartz crystal technique, June 1, 1946. In German.	1.50
705-707	Mounting of tungsten contacts on copper. 1939. In German.	1.50
708-715	Memorandum on the examination of various circuit breakers. 1939. In German.	2.50
716-718	Report on the construction of a new telephone network. 1946. In German.	1.50

To develop and produce models of beam power amplifier (100), pentode audio amplifier (225), and RF pentode amplifier (199). Sylvania Electric Products, Inc. Product Development Laboratories, Kew Gardens, N. Y. Interim engineering report on Contract W33-039-ac-19288 for Sep 1952, by David Rufus. Oct 1952. 4p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108317

Report no. YF52 B1/1167-29.
1. Amplifiers, Beam powder - Models 2. Amplifiers, Audio frequency - Models 3. Amplifiers, Radio frequency - Models.

Evaluation of contacts. Mallory, P. R. and Co., Inc., Indianapolis, Ind. Final engineering report, vol. III, under Contract no. AF33 (038)-11772, by Stanton T. East and Frank Spayth. Jul 1951. 41p drawings, graphs, fold table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108477

Report no. 100-M-2276 supplement "D", vol. III. For other reports under this contract see PB 108471-108476.
1. Contacts, Relay - Materials 2. Contacts, Relay - Tests 3. Contacts, Relay - Atmospheric pressure 4. Contacts, Relay - Design.

Magnetic amplifier survey, by Arthur Wahl. U. S. Air Force. Wright Air Development Center. Components and Systems Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1951. 10p diagrs, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108147

This report provides a brief summary of the principles of operation, the performance characteristics, and the methods of analysis of magnetic amplifiers in their present state of development in order to help determine where these amplifiers can advantageously replace vacuum tube amplifiers in Air Force equipment. Technical bulletin WCES-51-13. AAF WADC TR 51-13.

Miniaturized pulse cable. Federal Telecommunication Laboratories, Inc., Nutley, N. J. Interim engineering report no. 2 under Contract AF33(600)-9424 for quarter ending Oct 15, 1952, by J. J. Albanes. Nov 1952. 29p drawings, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108437

Plans for the extrusion of Teflon paste are discussed. The design of machinery required to extrude Teflon paste is reviewed. The application work of semiconducting layers on the conductor and dielectric is examined. The use of Teflon tape as jacketing material is also reviewed. For report no. 1 see PB 107723.

Motors, rectifiers, resistors and switches. Allgemeine Elektricitaets-Gesellschaft, Berlin. 1935-1943. 386f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $51.25. PB 84424

This FIAT microfilm reel consists of descriptive articles, pamphlets, drawings and parts lists for electric motors, industrial and electric railway rectifiers, resistor materials and switching equipment as listed below. Individual items will be available as enlargement prints only; the entire reel may be purchased in microfilm form for $9.00. Please include PB and frame numbers when ordering individual items from this microfilm reel. In German. FIAT Microfilm Reel J 246, Frames 1-381.

Frames	Title	Price
1-11	D-C motor for testing large internal combustion motors. 1940. In German. Brief description and drawings with technical data and photographs.	$3.75

Frames	Title	Price
12-21	Wind tunnel motor 4100-6000 kw, 500-600 rpm. 1938. In German. Technical data and drawings.	$2.50
22-36	Submarine motor 200-394 kw, 725-2000 rpm. 1944. In German. Brief description, drawings and photographs.	3.75
37-42	Asynchronous motor 300 kw at 30,000 rpm. 1942. In German. Brief description, drawings and photographs.	1.50
43-49	Horizontal water power generator, 50,000 kv. at 500 rpm. n.d. In German. Brief description, drawings and photographs.	2.50
50-63	Step-bearing for large water-power generators. 1941. In German. Description and drawings including a pamphlet on present development of synchro-motors for three-phase current at the A. E. G.	3.75
64-69	Arrangement for servo-motor for large slow-running water-power generators. 1940. In German. Brief description, drawings and photographs.	1.50
70-112	Single-phase motors for electric railways. 1935-1937. In German. Descriptive material, parts lists, drawings and photographs.	7.50
113-166	Single-phase motor for electric railways, 750 kw 600 v. 1944. In German. Descriptive material, drawings with parts lists and photographs.	8.75
166A-253	Mercury-arc rectifiers with steel tanks for industrial and railway applications. 1939. In German. AEG reports and articles with drawings, graphs and photographs.	12.50
254-261	Permanently sealed mercury-arc rectifiers with steel tanks. n.d. In German. AEG operation instructions pamphlet No. 342.	2.50
262-269	AEG article on vapor concentration and circulation in mercury-vapor rectifiers. n.d. In German. Graphs, drawings and photographs.	2.50
270-310	"Elektrische Bahnen" (Electric railways). Vol. 8/9, Aug-Sep 1937. In German. Periodical.	6.25
311-320	Converter for the "Wiesental railway." n.d. In German. Description with diagrams.	2.50
321-338	"Elektrische Bahnen" (Electric railways). Vol. 3/4, Mar-Apr 1937. In German. Periodical.	3.75
339-342	Article on alloys for wire-wound resistors. n.d. In German.	$1.50
343-343A	Article on improvements in starting and switching equipment. n.d. In German.	1.50
343B-378	AEG Pamphlet on universal rotary switches. 1941. In German. Drawings, graphs and photographs included.	6.25
379-381	AEG standards for switches, with drawings, parts lists and diagrams. 1943. In German.	1.50

Radiation resistance of a two-wire line, by J. E. Storer and R.W.P. King. Harvard University. Cruft Laboratory. Mar 1949. 22p diagrs, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108461

A general formula for the radiation resistance of a two-wire line is derived by means of a Poynting vector integration over a large sphere. The result is shown to be in agreement with that computed by other techniques. Formulas for the useful special cases of a lossless system and a nonresonant line are presented. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR69.

Review of fundamentals, circuits, general characteristics, and applications of magnetic amplifiers, by Siegfried R. Hoh. U. S. Air Force. Wright Air Development Center. Components and Systems Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Mar 1952. 36p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108146

Fundamentals, circuits, general characteristics, and applications of magnetic amplifiers are reviewed. The treatment of the subject is progressive and covers developments from the simple controlled saturable reactor through the more advanced amplifier types. Comparisons are made between magnetic amplifiers and electronic amplifiers. A bibliography of selected reference publications and a bibliographical index, according to subject, have been included as additional aids to electronic and electrical engineers in their utilization of the magnetic amplifier. AAF WADC TR 52-72.

Terminal impedance and generalized two-wire line theory, by R.W.P. King and Riyo Tomiyasu. Harvard University. Cruft Laboratory. Apr 1949. 39p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108462

Conventional transmission-line theory takes no account of variations in the parameters of the line and

of coupling near a terminating impedor or near any other change in its uniform properties. A theory is derived which substitutes for these effects a simple terminal-zone network of lumped series and shunt elements which may be evaluated for each type of termination or discontinuity. The apparent terminal impedance $\underline{Z}_{sa}$ (which is the impedance actually measured on a lossless line at a distance $\lambda/2$ from the termination) consists of this network in combination with the theoretical, isolated impedance, $\underline{Z}_s$, of the load. $\underline{Z}_{sa}$ for a fixed termination with a given $\underline{Z}_s$ may vary greatly with the nature of the connection to the line, the relative orientation of line and load, and the type of line and its dimensions. Contract N5ori-76, Task order no. 1, NR-078-011. Contents: Pt. I. General theory. - Part II. Effect of a bend. HU CL TR 74.

To develop and produce models of beam power amplifier (100), pentode audio amplifier (225), and RF pentode amplifier (199). Sylvania Electric Products, Inc. Product Development Laboratories, Kew Gardens, N. Y. Interim engineering report on Contract W33-038-ac-19288 for Oct 1952, by David Rufus. Nov 1952. 3p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108318

Report no. YF52 B1/1167-30.
1. Amplifiers, Beam power - Models 2. Amplifiers, Audio frequency - Models 3. Amplifiers, Radio frequency - Models.

Miscellaneous

Gain of electromagnetic horns, by E. H. Braum and W. T. Slayton. U. S. Naval Research Laboratory. Nov 1952. 18p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111085

Recent experimental evidence indicates that the measured gain of pyramidal electromagnetic horns may be considerably in error if the measurements are carried out at short distances, and if the aperture-to-aperture separation between horns is used in the gain formula $G = (4\pi R/\lambda)^2 P_R/P_T$. Further experimental verification of this effect has been obtained, and a theory has been developed which is in good quantitative agreement with present experimental data and demonstrates the physical reasons why the previous "far-field" criterion of $2D^2/\lambda$ is invalid. Curves are presented from which the error in gain measured at any distance may be obtained and applied as a correction. NRL R4077.

FOOD AND KINDRED PRODUCTS

Molds of meats, by F. A. Wolf. U. S. Quartermaster Food and Container Institute. Committee on Food Research. Under Contract no. W11-183-qm-194. Report no. 2 for period 1 Jul 1947 to 31 Oct 1948. 1948. 24p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108109

For 1st, 3d-8th reports see PB 108108, 108006-108010, 108110.
1. Meat - Preservation 2. Acetic acid - Fungicidal effect 3. Acetic acid - Esters - Use as fungicide. 4. Propionic acid - Fungicidal effect 5. Duke University, Durham, N. C.

Report no. 6 for period 1 Jul 1947 to 31 Oct 1948. 1948. 14p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108110

1. Meat - Preservation 2. Caprylic acid - Fungicidal effect 3. Hendecanoic acid - Fungicidal effect.

Sanitation and microbiology as related to vegetable dehydration, by R. L. Olson. U. S. Bureau of Agricultural and Industrial Chemistry. Western Regional Research Laboratory, Albany, Calif. Sep 1952. 16p Available from Western Regional Research Laboratory, Albany 6, Calif. PB 108105

Revision of sections entitled "Sanitation" and "Control of insects and mites" in U. S. Dept. of Agriculture. Miscellaneous publication no. 540, Vegetable and fruit dehydration, Jun 1944.
1. Vegetables, Dehydrated - Processing 2. Vegetables - Dehydration 3. AIC-344.

FUELS AND LUBRICANTS

Effective lubrication range for steel surfaces boundary lubricated at high sliding velocities by various classes of synthetic fluids, by Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. U. S. National Advisory Committee for Aeronautics. Dec 1952. 23p photos, diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108216

1. Lubrication - Theory 2. Surfaces, Contact - Lubrication 3. Lubricants, Synthetic - Research 4. Lubricants, Extreme pressure 5. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 6. NACA TN 2846.

Investigation of spontaneous ignition temperatures of organic compounds with particular emphasis on lubricants, by Charles E. Frank, Angus U. Blackham and Donald E. Swarts. U. S. National Advisory Committee for Aeronautics. Dec 1952. 40p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108386

1. Combustion - Research 2. Lubricants, High temperature - Tests 3. Ignition, Spontaneous - Temperature 4. Cincinnati. University 5. NACA TN 2848.

Literature survey of the effect of sub-zero temperatures on fuels and lubricants, by J. M. Lloy. National Research Council of Canada. Division of Mechanical Engineering. Fuels and Lubricants Laboratory. Jul 1952. 177p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.50, Photostat $22.50. Also available for exchange from National Research Council of Canada. Division of Mechanical Engineering, Montreal Road, Ottawa, Canada. PB 108138

The purpose of this literature survey is to provide in a readily accessible form a compilation of abstracts dealing with the sub-zero operation of aircraft and vehicles with particular emphasis on the part played by petroleum products in such operation. Parts I - VII provide a brief summary of the literature reviewed; Part VIII is an index of the abstracts by subject, Part IX contains 295 abstracts to the period 1 October, 1951; Part X contains abstracts of articles that became available before printing. NRCC MP-9.

Performance studies of experimental aviation fuels employing high anti-knock blend agents, by W. W. Frank and A. H. Fox. Standard Oil Co. of Indiana. Research Dept. Whiting Laboratory, Whiting, Ind. Jan 1951. 32p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108383

Report no. 10.
1. Fuels, Aviation - Anti-knock.

Report of the Fuel Research Board, with the report of the Director of Fuel Research for year 1951. Gt. Brit. Dept. of Scientific and Industrial Research. Fuel Research Board. 1952. 71p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108344

Sir Cyril Hinshelwood, Chairman. S. O. code no. 47-10-0-51.
1. Fuel - Research - Gt. Brit.

HIGHWAYS AND BRIDGES

Design of flexible airfield pavements for multiple-wheel landing gear assemblies. U. S. Waterways Experiment Station, Vicksburg, Miss. Report no. 1: Test section with lean clay subgrade. Sep 1952. 88p photos, drawings, graphs, tables Available from Waterways Experiment Station, Vicksburg, Miss. $1.00. PB 108181

The traffic tests and associated studies reported herein were performed for the purpose of developing methods for designing flexible pavements to accommodate the multiple-wheel assemblies of heavy planes. Traffic was applied to a test section, constructed of a medium-strength lean clay, with wheel assemblies simulating those of the B-29, B-50, and B-36 planes. The B-29 assembly was loaded to 70,000 lb (35,000 lb per wheel), the B-50 assembly to 100,000 lb (50,000 lb per wheel), and the B-36 assembly to 150,000 and 200,000 lb (37,500 and 50,000 lb per wheel respectively). Deflection measurements and other data on the behavior of the test section under traffic were obtained. Test results indicate that multiple-wheel design criteria developed by theoretical methods from already established single-wheel curves are reasonably correct for this test section, but are slightly on the unsafe side. WES TM 3-349.

INSTRUMENTS

Absolute calibration of visual sky photometers, by Ching-Sung Yü. Harvard University. Harvard College Observatory. Solar Dept. Jun 1952. 22p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108121

Scientific report no. 2. Contract AF19 (604)-146.
1. Photometers - Calibration 2. Photometers - Uses 3. HU HCO SR2.

Automatic high-speed computing, a progress report on the EDVAC, by J. Prosper Eckert, Jr. and John W. Mauchly. Pennsylvania. University. Moore School of Electrical Engineering. Sep 1945. 116p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 108394

Contract no. W-670-ORD-4926, supplement no. 4.
1. EDVAC (Binary electronic digital computer)
2. Computers, Digital 3. Computers, Electronic.

Direct-reading four-decade divider, by J. E. McGeogh and G. K. Jensen. U. S. Naval Research Laboratory. Oct 1952. 22p photos, diagrs (part fold) tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111087

A direct-reading four-decade frequency divider, successfully completed at NRL, is an improvement over other frequency dividers since it provides accurate and exact division by any whole number from 1 to 10,999, including prime numbers. The integer may be chosen at will from four ten-position selector switches that are directly calibrated for division ratio in decade fashion. The divider operates for any input frequency from the low audio range up to 450 kc without any form of adjustment except the selection of division ratio. This equipment was developed to provide step-frequency control of a disciplined oscillator as used in a frequency meter. NRL R4070.

Electrical cancellation and indicating system. Report prepared under direction of H. H. Beverage, covering period Oct 8, 1942 to Apr 15, 1943, under Contract OEMsr-748. Radio Corporation of

America. R.C.A. Victor Div., Camden, N. J. Apr 1943. 75p photos, fold drawings, diagrs (part fold), graphs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108188

A system has been developed which will cancel out any recurrent complex wave and give an alarm indication automatically when new wave components appear. To illustrate, suppose the received wave of an underwater detection system is to be monitored. This wave may be composed of a known transmitted signal and the fixed reflections occurring therefrom. It can be cancelled out and an alarm threshold established in such manner that the appearance of any new reflected or transmitted signal will operate the alarm. The basic system incorporates a scheme to produce a neutralizing wave, an arrangement for using this wave to balance out fixed signals, an oscilloscope to observe the adjustments, and an alarm device to call attention to any change in the signal. An experimental model incorporating the above functions has been constructed to demonstrate basic features of the cancellation principle. Typical applications are proposed in the report to illustrate various possible uses of the system. The application to panoramic reception is described in considerable detail since radar indication and submarine detection systems are equally applicable with minor modifications of the basic proposal. The wave generator portion of the system can be used to form coding waves useful in secrecy communication circuits. Multiple station monitoring and transient analysis applications are also described. Project PDRC-713. NDRC Div 13. OSRD 1408.

Evaluation studies of colorimetric and conductimetric dosimeters. Eastman Kodak Co. Distillation Products Industries Division, Rochester, N. Y. Under Contract DA18-108-CML-3617.

Monthly progress report no. 7, by M. E. Johnson, J. C. Swartz and A. R. Hamilton. Nov 1952. 28p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108163

1. Dosimeters, Colorimetric 2. Chloroform - Radiation sensitivity.

Monthly progress report no. 8, by M. E. Johnson, J. C. Swartz and A. R. Hamilton. Dec 1952. 11p graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108325

1. Dosimeters.

Geometrical efficiency of an end-windowed Geiger-Muller counter, an A.E.R.E. report, by G. B. Cook, J. F. Duncan and M. A. Hewitt. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jul 1950. 10p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 108197

The geometrical efficiency of an end-windowed Geiger counter is computed from the solid angle subtended by the window at a point source. This is compared with experiment. HD.364. S. O. code number is omitted. AERE C/R 552.

Handbook, maintenance instructions: Multimeter TS-352/U. U. S. Air Force and U. S. Bureau of Aeronautics. Mar 1950. 14p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108314

Basic issue.
1. Multimeters - Maintenance and repair 2. TS-352/U (Multimeters) 3. AN 16-35TS352-3.

Magnetic measurements of the Harwell 110" synchrocyclotron, an A.E.R.E. report, by J. B. Adams, T. C. Randle, and A. C. Edmunds. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jun 1950. 26p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 108198

In this report the methods used to determine the absolute strength and the shape of the magnetic field in the gap of the Harwell synchrocyclotron together with the apparatus used for the measurements are described in detail. HD. 347. S. O. code no. 70-674-0-3. AERE G/R 553.

Monochromatic light source for interferometry of high-speed gas flows, by D. B. Sleator, V. E. Bergdolt, F. D. Bennett. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Apr 1952. 18p photos, drawings, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108259

Interferometry of air flows about supersonic projectiles requires a high intensity light source with short duration and a high degree of monochromaticity. It is shown that a BH6 mercury flash tube and liquid prism monochromator together produce a satisfactory solution to the problem. Conventional glass filters fail because of excessive breadth of pass band; while interference type filters impose excessive requirements on intensity and collimation of the light. The problem of maximizing light transmission through the monochromator is analyzed, and the design of a liquid prism instrument employing CS_2 refractive medium is discussed. Finally, comparison of interferograms shows the improvement achieved over a conventional Wratten filter. Project no. TB 3-0108H of the Research and Development Division, Ordnance Corps. APG BRL M594.

Progress report (2) on the EDVAC, vol. II, covering chapters IV-IX. Report of work under Contract no. W-670-ORD-4926, supplements nos. 4 and 7, and under Contract no. W-36-034-ORD-7593, edited by T. Kito Sharpless. Pennsylvania. University. Moore School of Electrical Engineering, Philadelphia, Pa. Jun 1946. 171p diagrs (1 fold) Available from Library of Congress, Publication

Board Project, Washington 25, D. C. Microfilm $6.50, Photostat $22.50. PB 108133

For vol. I see PB 108132. For 1st report see PB 110330-110331.
1. EDVAC (Binary electronic digital computer) 2. Computers, Binary 3. Computers, Electronic.

Provningsföreskrifter för gyrokompasser original anschütz: Gyro 102 (Testing specifications for gyro-compasses of anschütz type, model gyro 102) Translated and edited by Prof. F. A. Raven. Sweden. Navy. Shipbuilding Section. Nov 1952. 5p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108148

1. Gyro 102 (Compass) 2. Compasses, Gyro - Tests - Sweden 3. STS 153.

Quantitative instrument reading as a function of dial design, exposure time, preparatory fixation, and practice, by Julien M. Christensen. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Sep 1952. 59p photo, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108436

The present experiment is the first of a series undertaken in an effort to determine the nature and significance of certain variables involved in the reading of dials. The subjects were required to read various types of dials at selected exposure times without knowledge of which one of the various dials used in the experiment would be exposed next. Six variables were considered in this experiment, viz., Subject, Exposure time, Practice, Moving Pointer vs Moving Scale, Clockwise vs Counterclockwise Rotation, and Point of Fixation. All effects were significant singly and/or in combination with other effects. Subjects interacted with all other variables, either singly or in combination. Exposure time was shown to be an exceedingly powerful and important factor. Relationships discovered at one exposure time became insignificant or even reversed at other exposure times. This interaction between dial type and exposure time casts serious doubt on the practice of inducing errors in dial reading experiments by the expedient of reducing exposure time. Some of the interactions changed with practice, showing the importance of level of training in experiments of this nature. Moving pointer dials were better than moving scale dials at exposure times of the same order as those used by pilots in actual flying situations. Dials with clockwise scales were generally superior to dials with counterclockwise scales. AAF WADC TR 52-116.

Stabilization of a microwave oscillator with an ammonia absorption line reference, by E. W. Fletcher and S. P. Cooke. Harvard University. Cruft Laboratory. May 1950. 88p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 108457

This report is primarily concerned with the problem of stabilizing a microwave oscillator on the 23,870 mc/s absorption line of ammonia gas. First, the various causes of instability of any stabilized microwave oscillator are examined theoretically, and means for improving the stability are described and experimental results are given. Second, the feedback loop is analyzed as a servomechanism, and its design and operation are discussed. Possibilities for further improvement of absorption-line frequency references are examined. This includes a discussion of the dependence of the feedback signal on the pressure and temperature of the ammonia and the dimensions of the waveguide cell. Contract N5-ori-76, Task order no. 1, NR-078-011. HU CL TR64.

Standard oscillator TS-39A/TSM-1. U. S. Army. Dec 1951. 93p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 108144

1. TS 39 A/TSM-1 (Oscillator) 2. Oscillators - Maintenance and repair 3. Oscillators - Operation 4. WD TM 11-2697.

Theory and design of voltage compensators, vol. 2, by Hans K. Ziegler. U. S. Signal Corps Engineering Laboratories, Ft. Monmouth, N. J. Jun 1952. 171p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.50, Photostat $22.50. PB 108256

Volume II outlines practical methods for the design of voltage compensators. It first introduces the methods which should be applied to determine the values upon which compensator designs are being based. The factors controlling the economy of the design of compensator transformers are then investigated in detail and a complete step by step design method to arrive at the most economical design is presented. For a wide range of practical values, design charts and diagrams have been computed to facilitate the work of the designer. A complete sample design is finally presented to insure a full understanding of the newly developed design methods. Dept. of the Army project no. 3-18-01-011. Signal Corps project no. 2071-B. For vol. I see PB 108255. SCEL ER 1076, Vol. 2.

Use of a flame photometer for estimating the cement content of soil-cement and pozzolan-cement mixtures, by U. W. Stoll and E. R. Streed. U. S. Naval Civil Engineering Research and Evaluation Laboratory, Port Hueneme, Calif. Jul 1952. 15p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107895

A method of estimating the cement content of soil-cement and pozzolan-cement mixtures has been developed. A flame spectrophotometer was employed to determine the calcium concentration from which the cement content was estimated. A preliminary evaluation indicates that the method is simple and

appears to offer a rapid means of checking the cement content of plant-blended pozzolan-cement mixtures as well as that of soil-cement field mixes. Project YD 430-3. NCEREL M-067.

Valve for glass blowing on apparatus contaminated with radio active or toxic substances, an A.E.R.E. memorandum, by F. T. Birks. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Feb 1951. 4p drawing Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107784

S. O. code no. 70-674-0-46.
1. Glass blowing and working - Equipment - Gt. Brit.
2. Valves, Glass blowing - Design - Gt. Brit.
3. Radioactive substances - Protection - Gt. Brit.
4. Atomic power - Research - Gt. Brit. 5. AERE C/M 97.

Verification of source size theory of Mach-Zehnder interferometer, by G. D. Kahl and F. D. Bennett. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Nov 1951. 18p photos, diagrs, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108261

The simplified theory of the Mach-Zehnder interferometer developed by the latter author is tested. The reduction in the visibility of fringes formed by the interferometer due to an extended area light source is shown experimentally. This reduction is shown to be caused by the superposition of two separate effects which are characteristic of the two angular coordinates of the unit vector pointing from the center of the collimating lens toward each point in the plane of the area-type source. The relation of each of the effects to that coordinate characterizing it is demonstrated experimentally to agree with the theory. The result of combining these two effects from all of the points of an area-type source is experimentally seen to cause the "focussing" of the visible fringes, and to limit them to a finite region of the intersecting beams determined by the size and shape of the source. Project no. TB3-0108J of the Research and Development Division, Ordnance Corps. APG BRL R777.

LUMBER AND WOOD PRODUCTS

Dry rot in wood, 5th edition, by K. St.G. Cartwright and W.P.K. Findlay. Gt. Brit. Dept. of Scientific and Industrial Research. Forest Products Research Laboratory, Aylesbury, Eng. Jan 1952. 50p photos, drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 107911

S. O. code no. 47-68-1-52.
1. Wood - Fungi - Gt. Brit. 2. Wood - Fungus proofing - Gt. Brit. 3. DSIR FPR 1.

Experimental development of high-speed continuous alkaline pulping, by William J. Nolan and Wilson F. Brown. Florida. University. Pulp and Paper Laboratory, Gainesville, Fla. Oct 1952. 14p graphs, tables Available from Florida Engineering and Industrial Experiment Station, University of Florida, Gainesville, Fla. PB 108137

Reprinted from Pulp and Paper Magazine of Canada. Paper presented at Technical section, C.P. P. A., International Pulping Conference, Murray Bay, Quebec, June 16-18, 1952.
1. Wood pulp - Manufacture 2. Sulfate pulp - Production 3. F EES TP75.

Identification of hardwoods, a lens key. Gt. Brit. Dept. of Scientific and Industrial Research. Forest Products Research Laboratory, Aylesbury, Eng. Mar 1952. 136p photos, map, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 107910

S. O. code no. 47-68-25.
1. Wood, Hard - Gt. Brit. 2. Timber - Gt. Brit.
3. DSIR FPR 25.

MACHINERY

Description of precision casting techniques utilized at Springfield Armory, by John H. Conant, Jr. U. S. Armory, Springfield, Mass. Nov 1950. 22p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108002

1. Casting, Precision - Methods 2. SA TR 19-1000.

Determination of air infiltration in fan testing equipment, by W. D. Scoates. Texas. Engineering Experiment Station, College Station, Texas. Nov 1952. 10p photos, drawings, graph Available from Texas Engineering Experiment Station, College Station, Texas. PB 108050

1. Fans - Testing equipment - Air infiltration
2. TU EES RR 40.

Development of a semiautomatic wax injection machine for making investment casting patterns, by S. Abrams. U. S. Frankford Arsenal, Philadelphia, Pa. Jul 1951. 13p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108113

The development of a semiautomatic wax injection machine for making investment casting patterns is described. A review is given of the design of wax injectors now in use, their problems, and associated defects. The novel features of the Frankford Arsenal

wax injection machine are discussed. The results of an investigation to obtain the optimum operating techniques are included. It was concluded that the machine resulted in more satisfactory injection of wax patterns than other types of machines tried. Project TB4-202C. FALR R-1023.

Double-drum dejuicing press, by R. B. Graham, A. H. Brown, and W. D. Ramage. U. S. Bureau of Agricultural and Industrial Chemistry. Western Regional Research Laboratory, Albany, Calif. Oct 1952. 10p photos, drawings Available from Western Regional Research Laboratory, Albany 6, Calif. PB 108104

1. Pear juice - Extraction machinery 2. Pressing machinery 3. AIC-343.

Effect of changing passage configuration of internal-flow characteristics of a 48-inch centrifugal compressor. II: Change in hub shape, by John Mizisin and Donald J. Michel. U. S. National Advisory Committee for Aeronautics. Nov 1952. 35p photo, diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St. N. W., Washington 25, D. C. PB 10[illegible]34

1. Compressors, Centrifugal - Flow 2. Impellers, Rotating - Internal flow 3. Flow - Theory 4. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 5. NACA TN 2835.

Efficiency of a pitot intake inclined to the air stream, by E. L. Place and R. Lecavalier. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1947. 8p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 107913

The present report describes the effect of inclining the pitot intake to the main air stream direction in the transonic Mach number range 0.7 to 1.5, an effect which is at present incalculable. Curves are presented showing the influence of inclination on intake adiabatic efficiency and air mass flow into the intake. These experimental results are then illustrated by application to the performance of a typical turbine engine and a propulsive duct in sonic and supersonic flight. Cover date is 1952. S. O. code no. 23-2621. ARC RM 2621.

Einfluss der lagergestaltung auf die belastbarkeit und die betriebssicherheit (Effect of bearing shape on the loading capacity and reliability of operation), by Alfred Buske. Aug 1952. 42p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108156

Translated and edited by F. A. Raven from Stahl und eisen, vol. 71, no. 28, p. 1420-1433, Dec 20, 1951.
1. Bearings, Friction - Lubrication - Germany
2. Bearings, Friction - Design - Germany
3. NAVSHIPS T489 4. STS 147.

Flow surfaces in rotating axial-flow passages, by John D. Stanitz and Gaylord O. Ellis. U. S. National Advisory Committee for Aeronautics. Nov 1952. 31p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108033

1. Compressors, Axial - Blades - Flow 2. Flow, Axial - Theory 3. Engines, Turbine propeller - Blades - Axial flow 4. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 5. NACA TN 2834.

Forging bucket alloys and cast bucket alloys, by Gunther H. Mohling and Gilbert A. Hanke, Jr. Allegheny Ludlum Steel Corporation, Pittsburgh, Pa. Oct 1950. 50p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108035

Object of this project was to develop both a forging and a cast turbine bucket alloy which has properties equal to those of alloys in present usage but with substantially reduced critical materials content. Goal set for the forging bucket alloy was a maximum of 20% cobalt, 6% tungsten, and 2% columbium. No alloys were found with properties equal to S-816 within these limits. However, an alloy was developed with 34% cobalt, 6% tungsten, and 2% columbium which is its equal. This represents savings of 10% cobalt and 2% columbium. The cast bucket alloy goal was 30% cobalt and 6% tungsten. An alloy containing 30% cobalt and 8% tungsten was developed which closely approximates physical properties of Vitallium. Savings of 35% cobalt with use of 2% more tungsten than was set in the original goal were effected. Final report under Contract AF33(038)-2040. AAF TR 6219.

Hermetically sealed mechanical drive. Quarterly technical report no. H6, period Aug-Oct 1952, under Contract AF33(038)-23311. Kearfott Company, Inc., Little Falls, N. J. Nov 1952. 8p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108311

For 5th report see PB 107531.
1. Drives, Mechanical.

Zahnfussfestigkeit geradverzahnter stirnräder aus stahl. (Root-strength of straight-toothed steel spur gears), by H. Glaubitz. Sep 1950. 33p diagrs, graphs tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108180

Translation of Institut für Maschinenelemente, Technische Hochschule, Braunschweig. Einzelbericht nr. 127. Sponsored research (Germany) Report no. 23. N. Report no. 127[1].
1. Gears, Spur - Steel - Root strength - Germany
2. Gears, Spur - Strength - Effect of tooth shape - Germany 3. Gears, Spur - Photoelastic tests - Germany 4. Gears, Spur - Stress analysis - Germany
5. Braunschweig. Technische Hochschule. Institut für Maschinenelemente 6. DSIR SR 23.

MEDICAL RESEARCH AND PRACTICE

Audibility-recognition sound pressure functions of the voiced cognate consonants, by Gilbert C. Tolhurst. U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla., and Ohio State University Research Foundation, Columbus, Ohio. May 1952. 46p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107343

Two distinct thresholds for the voiced cognate consonant sounds were determined from the judgments of 288 Ss. (1) The audibility (detection) thresholds were at a higher level than the total nonsense syllable, hence the vowel level, and that the syllable positioning for a particular consonant did not significantly affect its threshold level. (2) The recognition (intelligibility) thresholds were significantly higher than the audibility thresholds. There was a significant difference in the recognition threshold seemingly related to syllabic positioning. (3) At low levels the sounds heard as substitutions for the stimulus sounds changed the plosive-continuant characteristics unpredicably. Joint project report no. 11, Ohio State University Research Foundation, Columbus Ohio, under Contract N6onr 22525, Office of Naval Research Project Designation no. NR 142-992, and U. S. Naval School of Aviation Medicine, Bureau of Medicine and Surgery project NM 001.064.01.11. NMRI Proj NM 101 064.01.11.

Biological and medical aspects of ionizing radiation. Influence of nitrogen mustards on citric acid synthesis in vivo, by Kenneth P. DuBois, Jere Deroin, and Kenneth W. Cochran. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1952. 7p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108280

The influence of nitrogen mustards on citrate synthesis in rat tissues in vivo was studied using the fluoroacetate technic of Potter. The results of this study demonstrated that HN_1 and HN_2 produce alterations in citrate synthesis in certain tissues which are qualitatively similar to those produced by x-ray. Thus, a decrease in citrate synthesis was observed in spleen and thymus glands of nitrogen mustard — poisoned animals, and a marked increase in citrate accumulation was observed in the livers of male rats. The increase in citrate accumulation in the liver was evident after doses far below the LD_{50} and persisted for several weeks following sublethal doses of the nitrogen mustards. Contract no. AF33(038)27353. AAF SAM Proj 21-3501-0005, Report no. 1.

Effect of immunization and of reticuloendothelial blockage on susceptibility in mice acclimatized to altitude to Salmonella Typhimurium infections, by L. Joe Berry and Roland B. Mitchell. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1952. 9p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108193

Immunization raises resistance, and blockage of the reticuloendothelial system lowers resistance to infection; but neither changes the greater susceptibility to typhoid of mice exposed to altitude when the comparison is made between groups of animals that are strictly comparable except for the stress of altitude. The change at altitude that results in greater susceptibility appears after nine days in immunized mice and after six days in mice with the reticuloendothelial system blocked. In anemic mice, immunization and blockage of the reticuloendothelial system change mice from more resistant to more susceptible. These data suggest that such changes are independent of cellular and immune defenses. AAF SAM Proj. no. 21-35-005, Report no. 8.

Influence of acclimatization to altitude on susceptibility to intra stomachal infection with Salmonella Typhimurium, by L. Joe Berry and Roland B. Mitchell. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1952. 7p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108192

Mice infected intrastomachally with Salmonella typhimurium and kept in decompression chambers simulating an altitude of 20,000 feet are more susceptible than mice at normal pressures. Neither anemic mice nor mice adapted to altitude prior to infection have a final mortality significantly different from that of normal mice. Earlier work shows that the former are more resistant and the latter more susceptible than normal mice infected intraperitoneally with the same organism. Differences in response of such mice to infection via the two routes help to time the changes producing either an increase or decrease in susceptibility to infection. AAF SAM Proj. no. 21-35-005, Report no. 7.

Measurements of radio interference and modifications on Gomco section apparatus, work performed under Contract NObsr-52386, by R. Scott Fraser and Harry W. Kenny. Electro-Search, Philadelphia, Pa. Aug 1952. 29p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107999

Preliminary measurements of radio interference were made on Gomco Suction Apparatus, Model No. 98, Stock No. 3-752-75. The observed interference due to switching (impulsive interference) was much larger than that permitted under Navy Specifications. After use of shielding and filter theory in a number of modifications, one was developed by which interference was reduced to Navy limits except for a slight excess in the frequency region about 16 mc. This modification was regarded as being in substantial compliance with Navy requirements.

Radio interference measurements and modifications on Burdick model MF-49 diathermy, by Erwin

Levey. Electro-Search, Philadelphia, Pa. Jul 1952. 55p diagrs, graphs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108051

This report gives a detailed analysis of radio-interference tests performed on a Burdick MF-49 diathermy unit. In this work the unit was considered a source of interference. This interference is due to radiation and conduction of energy on the fundamental frequency and on harmonics. Various methods and techniques were tried to reduce the harmonic interference, and these are described in the report. Contract NObsr-52386.

Radio interference measurements and modifications on Liebel-Flarsheim model SW-660 diathermy, by Simon Kravitz. Electro-Search, Philadelphia, Pa. Sep 1952. 103p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 108053

This report provides a complete description of an investigation of the Liebel-Flarsheim Company's Model SW-660 Diathermy Unit. The investigation involved a series of radio-interference measurements that indicated the initial quantity of electrical noise emanating from the diathermy unit. Thereafter, an extensive series of modification attempts were embarked upon to reduce the radio interference. The discussion and tabulation of measurements thereon and subsequent modifications (some successful, some not) are throughly presented in the report. Contract NObsr-52386.

Rapid laboratory diagnostic procedures in microbiology, IV: Oncolytic effect of viruses in tissue cultures, by Morris Pollard and Robert H. Bussell. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1952. 7p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108194

Tumor implants, growing in roller tube cultures, demonstrated a marked oncolytic response to St. Louis encephalitis (SLE) infection. Two human and two rodent tumors were destroyed completely by SLE virus, less completely by neurotropic influenza virus. Infections with Lansing poliomyelitis, Newcastle disease, herpes, and chick embryo adapted influenza A viruses did not interfere with growth of tissue implants. The tissue culture technique can be used as a survey tool in rapidly determining the cytopathogenic effect of viral agents on tumors and as a means of isolating and identifying human pathogens which have not been transmitted to experimental laboratory animals. AAF SAM Proj. no. 21-35-006, Report no. 4.

Simplified technique for measuring the auditory intensity difference-limen, by F. A. Brogan. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1952. 12p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108274

A technique and instrument are described for testing the auditory intensity difference-limen. The instrument is a simple amplitude modulated circuit. The modulating range is flat from zero frequency to above 30 cycles. The modulated range is flat throughout the audio range. This technique is applicable to tests of the auditory intensity difference-limen in noise. AAF SAM Proj. 21-27-001, Report no. 9.

Some influences of delayed side-tone upon intelligibility, by Chester J. Atkinson. U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla. Jul 1952. 10p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107685

Various amounts of delay was introduced into the side-tone of speakers who read intelligibility tests. The effect of the delay was to decrease percentage of correct word reception in most instances. However when the delay was .05, .08 or .09 second, the percentage of correct word reception was significantly increased. Joint project report no. 13, Ohio State University Research Foundation, Columbus, Ohio, under Contract N6ONR 22525, Office of Naval Research Project Designation no. NR 142-993 and U. S. Naval School of Aviation Medicine and Bureau of Medicine and Surgery Project NM 001 064.01.13. NMRI Proj NM 001 064.01.13.

Studies, investigations, and applied research concerning radio interference instrumentation, development of pick-up devices, and evaluation of electro-medical equipment. Interim report no. 13, from 1 Jun 1952 to 30 Jun 1952, under Contract no. NObsr-52386, by Richard B. Schulz. Electro-Search, Philadelphia, Pa. Aug 1952. 11p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108052

For other reports on this contract see PB 107208-107211, 107213-107217, 107114, 107231.
1. Electromedical apparatus 2. Instruments, Measuring - Radio interference 3. Radio interference - Measurements 4. SW-660 (Diathermy unit) 5. Diathermy apparatus.

METALS AND METAL PRODUCTS

Anodic polishing for the removal of very thin layers from steel surfaces, by Wm. D. Urry and Einar Jensen. Carnegie Institution of Washington. Geophysical Laboratory. Jul 1944. 19p photos, drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107836

1. Polishing, Electrolytic 2. Steel - Polishing 3. NDRC AOM A-96 M 4. OSRD 3968.

Behavior of materials under repeated stress. Technical report no. 21: Use of a recrystallization

method to study the nature of damage in fatigue of metals, by G. M. Sinclair and T. J. Dolan. Illinois. University. Dept. of Theoretical and Applied Mechanics. Feb 1951. 21p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108040

A study was made to evaluate the relative extent to which disruption of atomic bonds occurs during the early stages of a fatigue test. Periodical reheating to the recrystallization temperature was employed as a means of removing the effects of work hardening developed by the repeated stressing. Since this processing did not significantly affect the finite fatigue life, it is concluded that disruption of atomic bonds is initiated in local regions during a relatively early stage of cyclic stressing. Contract no. N6-ori-71. For other reports see PB 104145, 104458, 104494, 105249.

Chromizing of steels, by L. M. Punsky. U. S. Naval Research Laboratory. Physical Metallurgy Division. Aug 1945. 21p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107847

The resistance to salt water corrosion of the high chromium cases formed by exposing various S.A.E. steels and special alloys to chromium chloride at temperatures of 900°C and above was found to depend on the carbon content. Unalloyed steels with less than 0.1 per cent carbon and those steels containing more than 0.1 per cent carbon plus the addition of molybdenum or titanium chromized successfully. Chromized steels containing 0.5 per cent molybdenum or titanium and less than 0.1 per cent carbon had excellent resistance to salt water corrosion. NRL M 2585.

Development of high temperature metalloscope, by E. H. Kinelski. Cornell Aeronautical Laboratory, Buffalo, N. Y. Sep 1949. 24p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108030

The development of a high temperature metalloscope for obtaining photomicrographs of metal structures at high temperature is outlined. A literature survey was conducted which ascertained the practicability of the metalloscope as a research tool for the investigation of metals at high temperatures. The design of the vacuum tight furnace, the vacuum system, and a suitable optical system consisting of microscope and camera is discussed. A metalloscope was built to take satisfactory photo- and cine-micrographs of 24 ST aluminum micro-structures up to 1000°F under a maximum vacuum of $4x10^{-5}$mm of Hg. Ternary eutectic melting was photographed at 935°F in 24 ST aluminum. Preliminary attempts to secure photomicrographs of heated SAE 4130 steel and 70-30 Cartridge Brass were unsuccessful due to an oxide formation which obliterated the micro-structure. Project Squid, Contract N6ori-119, Task order I, Phase 3, NR220-041. CAL TM 31.

Development of titanium-base alloys. Battelle Memorial Institute, Columbus, Ohio. Under Contract no AF(038)-3736.

Seventh progress report covering the period Jul 1 to Aug 31, 1950. Aug 1950. 22p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108091

Progress is reported in the development of a titanium-base alloys. Over one hundred ingots were melted, some of them of Ti-Cr; Ti-Mo; Ti-Mg; Ti-Fe; Ti-Co; or Ti-V compositions. Tensile properties were obtained on the titanium-molybdenum, titanium-iron, and titanium-vanadium series. A large number of the specimens tested were to brittle to develop their true strength, and a study is being made of the effects of surface contamination. The evaluation of the engineering properties of the 3% Cr, 1.5% Fe, 0.1% N alloy is in progress. Corrosion tests in sea water and in a humidity chamber indicate that unalloyed titanium and the 3% Cr, 1.5% Fe, 0.1% N alloy are more resistant to attack than 24ST Alclad and Monel. Creep-rupture tests are continuing at 600°-1100°F on Ti-Cr-Fe-N alloy, and preliminary welding tests of this alloy have shown that it is capable of being spot welded and flash welded. Pages numbered from p. 263 to p. 284. Contents: Arc melting of titanium-base alloys, by O. W. Simmons and C. T. Greenidge. - Evaluation of experimental titanium-base alloys, by P. D. Frost, F. Fawn and L. W. Eastwood.

Eighth progress report covering the period Sep 1 to Oct 31, 1950. Oct 1950. 38p fold tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108092

Progress made in the evaluation of exploratory titanium-base alloys, and the 3% chromium, 1.5% iron, 0.1% nitrogen alloy is described. Approximately eighty $\frac{1}{2}$-lb titanium-alloy ingots were melted. Tensile and bend properties were obtained on approximately sixty different alloys after various conditions of heat treatment. The ingots described are in various stages of fabrication. Some very interesting tensile properties are reported for a series of chromium-iron ternary alloys containing up to 5% chromium and 2% iron. Evaluation and stress-rupture tests of 3% chromium, 1.5% iron, and 0.1% nitrogen alloy are in progress and laboratory corrosion tests have been completed. Weldability, fatigue, Charpy impact, additional tensile, and compressive yield tests are being continued. Pages numbered from p. 285 to p. 316. Contents: Arc melting of titanium-base alloys, by O. W. Simmons and C. T. Greenidge. - Evaluation of experimental titanium-base alloys, by P. D. Frost, F. Fawn and L. W. Eastwood. Corrosion properties by F. W. Fink, R. S. Peoples, and H. A. Pray. - Stress-rupture properties, by W. F. Simmons and H. C. Cross.

Ninth progress report covering the period Nov 1, 1950 to Dec 31, 1950. Dec 1950. 70p photos, graphs (part fold), tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108071

The weldability investigation on the 3% Cr-1.5%Fe-0.1%N alloy was completed. Creep-rupture tests of 600°, 800°, 1000°, and 1100°F were also completed. Approximately thirty-seven 1/2- and 3/4-lb ingots of exploratory titanium-base alloys were melted. The latter are being processed for tensile and bend tests. Weldability studies on the 3%Cr-1.5%Fe-0.1% N alloy demonstrated that sound, strong welds can be obtained by spot welding, flash welding, and inert-gas arc welding. Spot welding appears to be the most easily accomplished. In most specimens tested, failure occurred in the parent metal or adjacent to the weld metal. Failures which took place in the weld metal were generally brittle. This indicates that obtaining adequate weld ductility is more critical in this alloy than obtaining soundness of strength. A description of the experimental work conducted on exploratory alloys is included. Paging numbered from p. 317 to p. 377. For reports on earlier contract see PB 104459-104460. Contents: Evaluation of the engineering properties of the 3% Cr-1.5% Fe-0.1% N alloy, by W. H. Kearns, R. D. Williams, and C. B. Voldrich. - Arc melting of titanium-base alloys, by J. A. Davis and C. T. Greenidge. - Evaluation of experimental titanium-base alloys, by J. O. Brittain, F. Fawn, P. D. Frost and L. W. Eastwood.

Effect of alloying elements on the electrical resistivity of aluminum alloys, by A. T. Robinson and J.E. Dorn. California. University. Institute of Engineering Research, Berkeley, Calif. Aug 1950. 24p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75.
PB 107991

10th technical report under Contract N7-onr-295, Task order II, NR-031-048.
1. Aluminum alloys - Electrical properties 2. Aluminum - Valence.

Effect of chromium plating on the endurance limit of 4340 steel, by George M. Cabble. Virginia. Engineering Experiment Station, Blacksburg, Va. Nov 1952. 22p graphs, tables Available from Virginia Polytechnic Institute, Blacksburg, Va. $.25.
PB 108176

The effect of chromium plating on the fatigue limit of AISI 4340 steel was determined by rotating beam fatigue tests on five groups of specimens: (1) 4340 steel not plated, (2) plated once, (3) plated once and baked once, (4) plated twice, and (5) plated twice and baked twice. It was found that a single chrome plating reduced the fatigue limit 21 percent and a second chrome plating reduced it another 10 percent. If the steel underwent a 45 minute baking treatment at 825°F. after being plated once, the fatigue limit was restored to 99 percent of that of the unplated steel. If the steel was baked after each of two plating baths, the fatigue limit was restored to 95 percent of that of the unplated steel. It also appeared that the second plating operation, whether followed by baking or not, introduced an uncertainty or scatter into the value of the fatigue limit. It was not determined whether this scatter was due to the second plating or to the simulated wear that the specimens received between platings. Bulletin of the Virginia Polytechnic Institute, Vol. XLVI, no. 1, November 1952. Engineering Experiment Station Series no. 82. VEES 82.

Effects of prior strain and aging at 212°F. upon the tension impact properties of two rimmed and two killed steels, by Walter H. Bruckner. Illinois. Engineering Experiment Station, Urbana, Ill. Feb 1950. 27p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75.
PB 108068

Two rimmed steels, E and RR, and two killed, Dr and RK, were used in studying the effects of prior strain and aging on tension impact properties. A strain equivalent to 5% elongation in tension was chosen as the prior strain level; the aging condition of 2 hr at 212°F was selected as roughly equivalent to natural aging at temperatures of 75 ±5°F for a period of 1/2 to 1 yr. It was found that an equivalent increase in transition temperature may be expected for both rimmed and killed steels for equivalent service-or fabrication-connected plastic strains, of the order of 5% elongation in tension. A killed steel having relatively low transition temperature may be so embrittled by plastic strain equivalent to 5% as to have a transition temperature equal to that of a sensitive rimmed steel in the as rolled condition. No appreciable effect due to aging at 212°F could be noted with respect to transition temperature for either steels. Technical report under Contract N6ori-71, Task order V, Project no. NR-031-182.

Experimental investigation of the behavior of 24S-T4 aluminum alloy subjected to repeated stresses of constant and varying amplitudes, by Herbert F. Hardrath and Elmer C. Utley, Jr. U. S. National Advisory Committee for Aeronautics. Oct 1952. 23p drawings, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C.
PB 107699

1. Beams, Rotating - Fatigue tests 2. Aluminum alloys - Fatigue tests 3. Aircraft - Structure - Tests 4. Loads, Aerodynamic 5. Loads, Structural - Theory 6. Materials, Aircraft - Tests 7. Machines, Testing 8. Moore, R. R., rotating-beam fatigue testing machines 9. 24S-T4 (Aluminum alloy) 10. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 11. NACA TN 2798.

Geographical aspects of manganese in the Union of Socialist Soviet Republics, by Thomas Stone Ryan. Jun 1949. 207p maps, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $7.50, Photostat $26.25.
PB 107849

A study has been made of the geographical aspects of manganese in the USSR, the objectives being to locate the manganese-ore deposits in relation to the steel producing regions of that nation and to ascertain the effect on steel production if the largest manganese sources were cut off by military operations. The general geology of manganese, the history of manganese mining in the USSR, and the industrial

uses of manganese are discussed. The geographical distribution of manganese-ore deposits presents a unique defense problem for the Soviet Union, but in 1938 the USSR had enough manganese ore stock-piled near the steel centers to last nine years at a 700,000 metric tons per year consumption rate. Thesis-Syracuse University. Contents: Appendix I. Translation of Mineral resources of the U.S.S.R: Manganese. - Appendix II. Report of the British consul on the manganese ore of Sharopan, 1893. - Appx. III. U.S.S.R. and world manganese and steel production. - Appx. IV. Regional production of manganese in U.S.S.R. - Appx. V. Manganese deposits in the U.S.S.R. - Appx. VI. Utilization of manganese in the steel industry.

Investigation of electrodeposited alloys and pure metals as substitutes for zinc and cadmium for protective finishes for steel parts of aircraft. Battelle Memorial Institute, Columbus, Ohio. Under Contract AF33(038)8750.

Sixth progress report, Aug 23-Oct 23, 1950, by A. B. Tripler, Jr., John A. Gurklis and C. L. Faust. Oct 1950. 29p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108070

Progress is reported on an investigation of electrodeposited alloys and pure metals as substitutes for zinc and cadmium for protective finishes for steel parts of aircraft. Work was continued on the manganese-zinc diffusion-alloy coatings and was started on manganese-cadmium diffusion-alloy coatings. Some further work has been done on the codeposition of zinc and lead. The "wet-dry" exposure tests were completed. Experiments on the diffusion of manganese and nickel have resulted in the appearance of an unidentified phase. The new phase does not appear to be manganese-nickel phase known heretofore. A group of iron-chromium alloy coatings (5% iron, 95% chromium) gave virtually no protection to the underlying steel when tested in the "wet-dry" cabinet. Pages numbered from p. 95 to p. 118. For final report on earlier contract see PB 97655s.

Seventh progress report, Oct 23 to Dec 23, 1950, by A. B. Tripler, Jr. and C. L. Faust. Dec 1950. 14p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108094

Progress is reported in the investigation of electrodeposited alloys and pure metals as substitutes for zinc and cadmium for protective finishes for steel parts of aircraft. Preparation of the coated steel panels for the outdoor exposure test has started. The second test of the manganese-zinc coatings on steel has not been completed, but has progressed far enough to support the previous conclusion that this type of coating is superior to zinc. It has been found that the initial rusting is somewhat delayed on zinc-coated panels whose surfaces were lightly nitrited prior to plating. Two alloys of zinc and silver are being tested in the "wet-dry" cabinet in contact with 24S-T aluminum and 24S-T alclad. The purpose is to determine whether silver from the corrosion products will deposit on the aluminum, thus setting up a silver-aluminum couple. Pages numbered from p. 119 to p. 130.

Investigation of methods for electrodepositing certain binary manganese alloys as protective coatings for steel parts of aircraft. First bimonthly progress report, Apr 4 to Jun 4, 1951, under Contract AF33(038)8750, supplemental agreement no. 3, by A. B. Tripler, Jr., and C. L. Faust. Battelle Memorial Institute, Columbus, Ohio. Jun 1951. 22p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108093

A search for information in the literature relating to binary manganese-alloy plating was conducted and details are discussed. Panels with manganese, manganese-zinc, and zinc-tin coatings, together with standards coated with cadmium, with zinc, and with zinc plus chromate, were placed on test.

Investigation of molybdenum and molybdenum-base alloys made by powder-metallurgy technique. Battelle Memorial Institute, Columbus, Ohio. Under Contract no. AF33(038)-12641. G-1494-1. Continues work started under Project Rand (Contract no. W-33-038-ac-14105).

First quarterly progress report Jun 1 to Sep 1, 1950, by W. L. Bruckhart, S. J. Whalen, R. I. Jaffee, and B. W. Gonser. Sep 1950. 72p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108096

Progress on the investigation of molybdenum and molybdenum-based alloys, including the continuation of binary-alloy development, investigation of ternary and more complex molybdenum-base alloys, and evaluation of high-temperature properties, is reported. A number of specimens fabricated during the RAND sponsorship were tested. Further investigation of molybdenum-carbon alloys was made in the range 0.055% to 1.0% carbon. An attempt was made to prepare molybdenum-silicon alloys in concentrations up to 5.0% silicon. Binary alloys of molybdenum with up to 0.4% cobalt were found to be workable and showed improvements over alloys containing lesser amounts of these additions.

Second quarterly progress report Sep 1-Dec 1, 1950, by W. L. Bruckart, C. M. Craighead, and R. I. Jaffee. Dec 1950. 74p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108066

Progress is reported in the investigation of molybdenum and molybdenum-base alloys made by powder-metallurgy techniques. Chemical analyses and metallographic studies of a number of binary molybdenum-base alloys are included. Changes in sintering techniques and equipment are described. Procedures for recrystallization studies and for creep-rupture testing are outlined. Ternary alloy work was resumed with the use of a new alloying technique.

Third quarterly progress report Dec 1, 1950 to Mar 1, 1951, by W. L. Bruckart, M. H. La Chance, C. M. Craighead and R. I. Jaffee. Mar 1951. 69p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $3.00, Photostat $8.75. PB 108067

Progress is reported on the investigation of molybdenum-base alloys prepared by powder-metallurgy techniques. The work accomplished during this period covers extension of data on binary alloys, preparation of ternary alloys, recrystallization studies, and evaluation of molybdenum made from several sources of molybdenum powder. Several of the clad molybdenum-alloy specimens were prepared for creep-rupture testing. Sintering of the core materials was conducted in the standard way and is discussed under the binary alloys section.

Kinetics of the corrosion of magnesium in moist air, by J. B. Regan and M. S. Silverstein. U. S. Frankford Arsenal, Philadelphia, Pa. Nov 1950. 36p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108111

The corrosion of magnesium in moist air has been investigated and found to consist of the reaction of the magnesium with water vapor to produce magnesium hydroxide and hydrogen. A kinetic equation was formulated which yields a single measure of the reaction rate of a sample of magnesium under specified conditions of temperature and humidity. The reaction rate constant was shown to be directly proportional to the initial specific surface of the magnesium, and independent of oxygen partial pressure between 0 and 390 mm Hg at temperatures up to 60°C. The exponential factor by which water vapor partial pressure effects the reaction rate was found to be 0.65. The temperature coefficient of the reaction was also determined, and the activation energy was found to be 16,400 calories per mole. Project TS 1-23. FALR R-981.

Machining of powdered iron materials and ferromagnetic ferrites, by A. A. Feldmann. U. S. National Bureau of Standards. Mar 1952. 10p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Microwave Laboratory, National Bureau of Standards, Washington 25, D. C. PB 108118

Ferromagnetic materials have received much attention in recent years. To previous uses as transformer cores at low frequencies have been added applications in high frequency magnetic circuits. Magnetic amplifiers, and a type of attenuator recently developed at the National Bureau of Standards are based on the properties of these materials. Much development work involving the application of these materials in various shapes and forms is expected to go on for some time to come. Since the machining of the various types of materials presents great difficulties and calls for special techniques, the following report was compiled. Polyirons, Ferrites and Ground Ferrites suspended in binders, altogether 28 individual materials and their machinability, are discussed. NBS Project 1409-31-1458. NBS 153.

Molybdenum alloys and protection by cladding, by W. L. Bruckart, S. J. Whalen, R. I. Jaffee, B. W. Gonser. Battelle Memorial Institute, Columbus, Ohio. Apr 1950. 153p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.00, Photostat $20.00. PB 108069

Experimental work is reported, covering 58 different compositions in ten alloy groups, including unalloyed molybdenum, in the form of 0.040-in. strip finish rolled at 1250°C and annealed ½ hr at 1100°C. Mechanical properties of the alloys were in general superior to those of unalloyed molybdenum. Outstanding binary alloys, on the basis of room-temperature mechanical properties, were 0.25%Co, 0.25%Fe, 0.25% Si, 1%Cr, and 40%W. Outstanding on the basis of ease of fabrication, combined with good mechanical properties, was the 0.25%Si alloy. The alloy with the best strength-ductility characteristics contained 0.25%Co. The strongest alloy produced contained 40%W. A summary of the groups investigated, their ranges, and the strongest alloy having adequate ductility in each group, is presented in tabular form. R-200.

Pressed metal. Report of a visit to the U.S.A. in 1949 of a productivity team representing the pressed metal industry. Anglo-American Council on Productivity. Jul 1950. 60p photos, map, drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.65. PB 106448

1. Metal industries 2. Presses - Powder metallurgy 3. Material handling.

Spot welding of armor plate and low alloy steels. Rensselaer Polytechnic Institute, Troy, N. Y. On N.D.R.C. research project NRC-12, Contract OEMsr-391.

Report no. 1: Spot welding of 1/4" and ½" NAX 9115-X steel plate, by W. F. Hess, W. D'O. Doty, A. Muller, J. M. Parks. Dec 1942. 141p photos, graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photostat $18.75. PB 108190

1. OSRD 1218 2. NDRC Div 18.

Report no. 2: Spot welding of attachments to face hardened armor, by W. F. Hess, W. D'O. Doty, A. Muller, J. M. Parks. Oct 1943. 85p photos, diagrs, graphs, fold tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 108189

1. WMC M-161 2. OSRD 3024.

Report no. 4: Preparation of spot welded ballistic plates by the International Harvester Company, Springfield, Ohio, by W. F. Hess, A. Muller, W. D'O. Doty. Mar 1944. 33p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108187

Four duplicate double-I type spot welded ballistic plates were prepared using 5/16" armor with six different butt strap combinations of material and thickness. Welding conditions for each of the six combinations were established with the aid of drop

impact tests and the examination of weld sections. The plates were welded using a machine which employed a thermocouple located in one of the electrodes for control purposes. This type of welding equipment is intended to automatically compensate for changing reactance, residual heat in the plates, and the short-circuiting effect of adjacent welds. Measurements of the currents and times used for welding and heat treating each of the individual spots in a typical plate were made for all six combinations. Typical thermal records showing the temperatures reached during the various stages of heat treatment were obtained for several of the welding conditions which were established for the ballistic plates. Measurements were also made of the pressure cycle used for welding, and the volume and temperature of the brine solution used for cooling the electrodes. Current variations from weld to weld, apparent from the measurements, indicated that the automatic current compensation feature was not functioning properly. Variations in temperatures reached during heat treatment, noted on typical thermal records, indicated that the thermocouple equipment did not provide adequate control of the heat treating operations. Since previous experience has indicated that pronounced changes in weld properties result from erratic operation, consistent ballistic performance of these plates is not to be expected. WAC M-255. OSRD 3547.

Final report, part I: Fundamentals of spot welding steel plate, by W. F. Hess, A. Muller, W. D. Doty, J. M. Parks. Oct 1944. 126p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 108191

1. WMC M-331 2. OSRD 4336.

Steel economy bulletins, no. 1: Design of buildings. Gt. Brit. Ministry of Works. Aug 1952. 4p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 108046

1. Steel - Wear resistance - Gt. Brit. 2. Building materials - Conservation - Gt. Brit. 3. Buildings, Steel - Construction - Gt. Brit. 4. Buildings, Steel - Design - Gt. Brit. 5. MOW SEB 1.

Steel founding. Report of a visit to the U.S.A. in 1949 of a productivity team representing the steel founding industry. Anglo-American Council on Productivity. Sep 1949. 118p photos, map, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 106453

1. Steel foundries 2. Foundry practice 3. Foundry practice - Equipment.

Summary of progress in the investigation of phase relationships between metals and oxides in air at high temperatures. Summary report, July 22, 1949, under Contract N6ori-143 , NR032-022, by J. F. Mahon. New York State College of Ceramics, Alfred, N. Y. Jul 1949. 67p photos, drawings, diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107990

1. Alloys, Binary - Equilibrium diagrams 2. Alloys, High temperature - Research 3. Ceramic materials - Spectrographic analysis 4. Metals - Oxidation 5. Metals - Diffusion 6. Metals - Reactions 7. Furnaces, High temperature - Design.

Welding of face hardened armor (OD-74). Final report under NDRC research project NRC-16R, by P. C. Cunnick, J. K. McDowell, D. H. Drury, and C. B. Bartel. U. S. Arsenal, Rock Island, Ill. Aug 1944. 58p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108186

Face hardened armor plate of the high nickel-molybdenum type cannot be welded in the carburized condition with complete freedom from cracking using modified 18-8 electrodes and a procedure in which deposited weld metal comes in contact with the high carbon side of the plate. The uncarburized or back side of the plate is readily weldable with modified 18-8 electrodes. Bead tests on the surface and edge of 1/4" and 1/2" armor plate in the uncarburized, carburized and annealed, and carburized and hardened condition were used to determine susceptability to cracking. A study of various precladding and welding procedures indicate that the following sequency of operations, while not excluding completely the possibility of cracking in the head affected zone, should provide the most satisfactory welded joint, that can be obtained on face hardened armor plate using modified 18-8 electrodes: (a) preclad edge of carburized and annealed plate, (b) weld joint, (c) quench and temper. In precladding plate edges, the weld deposit may not remain austenitic due to excessive dilution of weld metal and base metal. Considerable cracking occurred in welding joints in carburized and hardened plate with the NRC-2A manganese-molybdenum ferritic electrode. WMC M-304. OSRD 4081.

METEOROLOGY AND CLIMATOLOGY

Analysis of climatological data for the spring cloud-seeding period over north central Colorado, by Sol D. Resnick. Colorado. Agricultural Experiment Station. Civil Engineering Section, Fort Collins, Colo. Prepared for Northern Colorado Natural Resources Association, Fort Collins, Colo. through the Colorado Agricultural Research Foundation. Jun 1952. 86p maps (1 fold), graphs, tables Available from Civil Engineering Dept., Colorado A and M College, Fort Collins, Colo. PB 107922

1. Clouds - Seeding 2. Climatology - Research 3. Rain and rainfall 4. Rain and rainfall, Artificial 5. Precipitation 6. Northern Colorado Natural Resources Association, Fort Collins, Colo. 7. Colorado Agricultural Research Foundation.

Atmospheric flow patterns and their representation by spherical-surface harmonics, by B. Haurwitz and Richard A. Craig. U. S. Air Force. Cambridge Research Center. Geophysics Research Division, Cambridge, Mass. Jul 1952. 78p diagrs, graphs, tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 107898

Some theoretical and empirical investigation of large-scale flow patterns in the atmosphere are presented. These investigations are characterized primarily by the use of spherical coordinates. Interrelationships between the strength of this flow and other meteorological parameters are studied statistically. A method of spherical-harmonic analysis is described and applied to several weather maps. Tables are presented to facilitate future applications of spherical-harmonic analysis. Condensed report of work done in 1944 at Massachusetts Institute of Technology. Meteorology Dept. on the Flow Pattern Project. AAF GRD P 14.

Collection of long-lived natural radioactive products from the atmosphere, by P. King, L. B. Lockhart, Jr., R. A. Baus, R. L. Patterson, Jr., H. Friedman, and L. H. Blifford, Jr. U. S. Naval Research Laboratory. Oct 1952. 12p photos, graph, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111078

Long-lived radium decay products (RaD, RaE, Po) were collected from the atmosphere by the use of air filters and rain water. A workable procedure was developed to separate traces of these active materials from rain water through use of aluminum hydroxide floc as a preliminary concentrating agent. Rain effectively removes significant quantities of RaD, RaE, and Po from the atmosphere. The first part of the rain removes a relatively larger portion than later parts of the rain, but all fractions of the rain contain some activity (RaE). There is no simple correlation of the activity collected with the character of the rain, the seasons, or the quantity of dirt present in the collection. NRL R 4069.

Cooperative turbulence study of August 30-31, 1951 at the Brookhaven National Laboratory. Pennsylvania State College. Mineral Industries Experiment Station. Div. of Meteorology. Scientific report no. 1 under Contract no. AF19 (604)-166, by H. A. Panofsky. Jun 1952. 54p map, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108076

1. Atmosphere - Turbulence - Meteorological aspect 2. Instruments, Meteorological 3. Turbulence - Research 4. Kinetic reactions.

Excitation of molecular spectra, I: Ionisation in air maintained by a uniform plane circular distribution of α radioactivity, by R. W. Nicholls. University of Western Ontario. Dept. of Physics. Nov 1952. 8p diagr, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108232

The rate of ionisation maintained in air in the region of a uniform plane circular distribution of α radioactivity has been computed numerically, and is shown graphically. Such information is of interest as a lower limit of the excitation rate maintained by the same source, and is of use in the interpretation of spectroscopic experiments in the excitation of radiation by the passage of positive ions (α particles in this case) through gases. Contract no. AF19 (122)-470. Scientific report no. 2.

Investigation of mantle Rayleigh waves, by Maurice Ewing and Frank Press. Columbia University. Lamont Geological Observatory, Palisades, N. Y. Sep 1952. 31p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107982

Dispersion of Rayleigh waves for a new range of periods ranging from 1-7 minutes is described. The group velocity curve shows a long period and short period branch merging at a minimum value of 3.54 km/sec with a corresponding period of about 225 sec. It is suggested that the known variation of velocity with depth in the mantle can account for the observed dispersion. The smaller scatter in the velocities and the absorption of these waves suggests that unlike microseisms, refraction and attenuation effects are negligible at the continental margins. From the absorption of mantle Rayleigh waves the internal friction in the upper mantle for periods of 140 and 215 sec is found to be given by $1/Q = 670 \times 10^{-5}$. This is of the same order as that reported from vibration measurements at audio frequencies on laboratory samples of crystalline rocks at normal pressure and temperature. Technical report on seismology no. 23 (Contract report no. 22). Contract no. AF19 (122) 441.

Measurements of the structure of turbulent flow at a height of 2.3 meters, by H. E. Cramer and F. A. Record. Massachusetts Institute of Technology. Round Hill Field Station, South Dartmouth, Mass. Aug 1952. 86p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 108075

Simultaneous observations of air temperature, wind speed, and wind direction (both azimuth and elevation angles) were made at a height of 2.3 m in a large field. Measurements were obtained with three hot wire anemometers, three sensitive thermocouples, and one bivane; the time constants of these instruments range from about 0.1 to 0.5 sec. Six periods of observation during the afternoon and evening of 25 October 1951 have been analyzed; each sampling period was approximately 7 min in length and data were recorded by photographing two panels at the rate of one frame per second. Frequency distributions of the measured quantities are shown to be approximately Gaussian; the mean amplitude of the wind speed fluctuations is found to be proportional to the wind speed while the mean amplitude of

the temperature fluctuations is proportion to the departure of the lapse rate from adiabatic. Correlations between temperature, wind speed, azimuth angle, and elevation angle are presented; the sign of the coefficients in most cases is correctly predicted by simple vertical displacement and a knowledge of the profiles of mean temperature and wind speed. Largest correlation is found between temperature and wind speed. Values are indicated for the transverse and longitudinal scales of turbulence for both temperature and wind speed; the transverse scale is in every case smaller than the longitudinal scale. The transverse scale of temperature appears to be smaller than that of wind speed while the longitudinal scales for both temperature and wind speed are of similar dimension. Eddy components of velocity are computed for each period of observation; the average value of the ratio $\overline{u}' : \overline{v}' : \overline{w}'$ is 1.0; 0.63; 0.43. The horizontal shearing stress τ varies from 0.2 - 5.0 g $cm^{-1}sec^{-2}$, with the lowest values occurring at night. Scientific report no. 1 under Contract no. AF 19 (604)-145.

Micrometeorology of the surface layer of the atmosphere. Johns Hopkins University. Laboratory of Climatology, Seabrook, N. J. Under Contract no. W28-099-ac-378.

Index to interim reports 1-18, final report, Jan 2, 1948 to Jun 30, 1952. Jun 1952. 14p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108128

Dr. C. W. Thornthwaite, Director.
1. Micrometeorology.

Interim report no. 18, Apr 1-Jun 30, 1952. Jun 1952. 116p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 108159

Hourly profiles of wind velocity, air and soil temperature are presented in appendix I together with measurements of smoke dissipation, total and net radiation, and soil moisture and density during five periods of 24 hours each. Additional measurements of surface characteristics and wind profiles over a growing corn field are given in appendix II. Work on a small whirling-cup anemometer is described. Appendices II through X contain reports of maximum and minimum temperatures and precipitation from a network of 54 microclimatological stations; computed and observed values of evapotranspiration obtained with seven evapotranspirometers; and a continuous record of insolation and wind velocity at the Laboratory.

Observed mean field of motion of the atmosphere, by Yale Mintz and Gordon Dean. U. S. Air Force. Cambridge Research Center. Geophysics Research Division, Cambridge, Mass. Aug 1952. 63p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107901

USAF Contract 19 (122)-48.

1. Winds - Direction 2. Winds - Velocities - Measurement 3. Atmosphere - Disturbances - Measurement 4. AAF GRD P17.

Semi-monthly mean sea-level pressure maps for the Mediterranean area, by Werner A. Baum and Lawrence B. Smith. Florida. University. Dept. of Meteorology. Jul 1952. 39p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107938

Scientific report no. 2. Prepared under Contract AF 19 (122)-466 with the Geophysics Research Division, Air Force Cambridge Research Center.
1. Atmosphere - Pressure - Measurement - Mediterranean Sea 2. Isobars - Mediterranean sea.

Survey of problems for solar observations, by Donald H. Menzel and Barbara Bell. Harvard University. Harvard College Observatory. Solar Dept. Jun 1952. 21p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108120

This report outlines a number of solar problems for observational investigation. The outline is intended to serve as a long-range guide for planning the observation programs at the Sacramento Peak Station, and should not be interpreted as an expression of immediate intentions. We discuss patrol programs for daily observations of prominences, flares, etc., some of which are already in operation at the Peak, and mention possible eventual improvements. The major part of the report discusses background research programs for the 16-inch coronagraph. We consider research on both active and normal solar features. The active features of the sun are, of course, more directly related to terrestrial disturbances, but these active features can best be interpreted in terms of a well-established reference system of normal solar conditions. In connection with each program we list the accessory equipment necessary to carry it out. Some of the observations can well be made with equipment already existing at other solar observatories and will not necessarily be attempted at the Peak. Scientific report no. 1. Contract AF19 (604)-146. HU HCO SR1.

Transmission of infrared in cloudy atmosphere, by H. Gaertner. Jun 1947. 70p graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.30. PB 108077

Translation based on ATR Translation no. 346.
1. Light - Attenuation - Germany 2. Infrared radiation - Transmission - Germany 3. Fog - Light absorption - Germany 4. Photography, Infrared - Germany 5. ATR/T346 revised 6. NAVORD 429.

MINERALS AND MINERAL PRODUCTS

Influence of nonmartenstic transformation products on mechanical properties of tempered martensite,

by J. M. Hodge and W. T. Lankford. U. S. National Advisory Committee for Aeronautics. Dec 1952. 13p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108218

1. Martensite - Mechanical properties 2. Bainite - Effect on steel 3. Steel - Bainite content 4. Steel - Ferrite content 5. Steel - Pearlite content 6. United States Steel Co. 7. NACA TN 2862.

Note on the investigation of alumina by means of the Hahn emanation technique and X-ray measurements, by S. Moorbath. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1952. 4p graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 108196

S. O. code no. 70-674-0-92.
1. Alumina - X-ray inspection - Gt. Brit. 2. Atomic power - Research - Gt. Brit. 3. AERE C/M 127.

PACKING AND PACKAGING

Elimination of corrosion from the interior of cans for bread. U. S. Quartermaster Food and Container Institute. Aug 1952. 17p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111063

Termination report under Project np. 7-91-03-014.
1. Containers, Food - Corrosion prevention 2. Containers, Food - Linings 3. Bread, Canned - Storage 4. QMC FCI Proj. 7-91-03-014, Final report.

PHOTOGRAPHIC AND OPTICAL GOODS

Photoelastic study of dynamic stresses in structures, by M. M. Frocht and P. D. Flynn. Illinois Institute of Technology. Dept. of Mechanics, Chicago, Ill. Jun 1952. 44p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108342

The results of a comprehensive survey of the literature on dynamic photoelasticity is given in this report. Twenty papers covering the period from 1928 to the present day have been studied, abstracted, and evaluated. The report further deals with developments in high speed photography from the point of view of selecting or designing suitable equipment for dynamic photoelastic investigations. Theoretical solutions for two basic dynamic problems were studied: the longitudinal impact of a bar in compression, and the central impact of a beam. Contract no. NOy-28149. Project order 10703. Final report on the first phase of the study. Technical report to the U. S. Navy Bureau of Yards and Docks, U. S. Naval Civil Engineering Research and Evaluation Laboratory Structures Research Dept., Port Hueneme, Calif.

Reduction of fixed camera data, by Bernard Dimsdale, edited by Austin R. Brown, Jr. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Aug 1952. 42p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108267

A new method for the reduction of non-synchronous data from fixed cameras is presented. Graphical and velocity interpolations are eliminated; instead, interpolation from the two sides is done in terms of the sine of the angle between the normal to the plane containing the center of gravity of the missile and the two cameras and the plane containing the origin and the two cameras. A complete least-square method for calibration is also presented. This method has been used by the Ballistic Research Laboratories for the reduction of non-synchronous trajectory data. Project no. TB3-0838 of the Research and Development Division, Ordnance Corps. APG BRL R 831.

PHYSICS

General

Limit analysis of two and three dimensional soil mechanics problems, by D. C. Drucker. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Aug 1952. 23p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108123

A brief discussion is given of suitable general forms of the yield or sliding criterion for soils. Coulomb's equation is interpreted in terms of a modified Tresca as well as a modified Mises rule. Particular attention is given to a soil unable to take tension but which exhibits both cohesion and internal friction in sliding action. Indication is given of an interesting development of complete solutions as obtained by Hill and Lee. The stability of unbraced vertical-walled cuts is then treated. It is shown that the critical height is $\frac{2c}{w} \tan\left(45 + \frac{\varphi}{2}\right)$ for a soil unable to take tension. A brief description of the application of the general limit theorems to inhomogeneous soil is also included to demonstrate their power. Contract N7onr-35801, T. O. I, NR-041-032. GDAM A11-76/23. GDAM TR 76.

Nuclear

Influence of a cylindrical channel on a periodic neutron density distribution, an A.E.R.E. report, by B. Davison. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1951. 22p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108201

HD. 543. S. O. code no. 70-674-0-34. Appendix A: An alternative proof of the lemma.
1. Neutrons - Scattering - Gt. Brit. 2. Neutrons - Distribution - Gt. Brit. 3. Fourier analysis - Gt. Brit.

4. Atomic piles - Neutron distribution - Gt. Brit. 5. Atomic power - Research - Gt. Brit. 6. AERE T/R 738.

Method of calculating the critical dimensions of spherically symmetrical reactors, I, an AERE report, by H. M. Melvin. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1950. 11p graphs (2 fold) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108200

A method is described of calculating the critical dimensions of spherically symmetrical reactors comprising a homogenous core of fissile matter contained in an infinite homogeneous tamper of scattering and absorbing, but non-multiplicative, material. HD. 414. S. O. code 70-674-0-5. AERE T/R 586. AERE T/R 108, rev.

PRINTING, PUBLISHING

Development of lithographic offset press 22- by 29-inch, sheet size, by Thomas J. Hepler. U. S. Army. Corps of Engineers. Engineer Research and Development Laboratories, Fort Belvoir, Va. Jun 1950. 17p photos, drawing, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108143

Interim report, Project 8-35-09-002.
1. Presses, Lithographic - Offset - Design 2. ERDL R1172.

RUBBER AND RUBBER PRODUCTS

Development and formulation of low temperature isobutylene (butyl) rubber compounds. Quarterly report no. 4 for quarter ending Dec 31, 1948 under Contract no. W36-039-sc-35580, by L. J. Radi and N. G. Britt. Interchemical Corporation. Research Laboratories, New York, N. Y. Jan 1949. 22p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108114

Project no. 1210. Dept. of the Army project 3-93-00-500. Signal Corps project 2005.
1. Rubber, Butyl - Production 2. Rubber, Synthetic - Production 3. Polyisobutylene - Uses 4. SIG Contract W36-039-sc-35580, Report no. 4.

STRUCTURAL ENGINEERING

Buckling of low arches or curved beams of small curvature, by Y. C. Fung and A. Kaplan. U. S. National Advisory Committee for Aeronautics. Nov 1952. 75p photo, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108126

1. Beams - Buckling 2. Plates, Curved - Stresses 3. Structures - Strains and stresses 4. Loads, Strucutral - Theory 5. California Institute of Technology, Pasadena, Calif. Guggenheim Aeronautics Laboratory 6. NACA TN 2840.

Floor finishes for houses and other non-industrial buildings, by H. M. Llewellyn and F. C. Harper. Gt. Brit. Dept. of Scientific and Industrial Research Building Research Station, Watford, England. Revised edition. 1952. 28p tables (1 fold) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 102329r

S. O. code no. 47-549-11-52. Contents: Appendix A: Comparison of properties of floor finishes. - Appendix B: Specification for flooring. - Appendix C: List of British standards and code of practice. - Appendix D: Damp-proof membranes for concrete.
1. DSIR NB B 11 Revised.

Overall heat transmission coefficients of building sections, by A. D. Kent and H. L. Hall. National Research Council of Canada. Division of Building Research. Feb 1951. 36p drawings, tables Available from National Research Council of Canada, Ottawa, Canada $.25. PB 108160

Technical report no. 7 of the Division of Building Research.
1. Insulation, Thermal - Buildings - Canada 2. Heat - Transmission - Canada 3. Building materials - Thermal conductivity - Canada 4. NRCC DBR 16.

Preservation of timber and metal. Gt. Brit. Ministry of Agriculture and Fisheries. Aug 1952. 20p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.25. PB 108134

Fixed equipment of the farm leaflet no. 17.
1. Farms - Buildings - Preservation - Gt. Brit.
2. Metals - Coatings, Protective - Gt. Brit. 3. Wood - Preservation - Gt. Brit.

TEXTILES AND TEXTILE PRODUCTS

Mechanics of bent yarns, by Stanley Backer. U. S. Office of the Quartermaster General. 1952. 35p photos, diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.00. PB 111080

It is the purpose of this report to formalize the elements of bent yarn geometry through careful analysis of an idealized yarn structure. The products of such an analysis are expressed in mathematical relationships presented in a form most useful to the textile materials engineer. To encourage use of the results by practical designers, an effort has been made to present complete graphical conversions from practical textile data to the dimensionless

parameters utilized for maximum generality in the analysis. QMC TSR 74.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

Abstracts of papers published externally. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1951. 15p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 108063

Cover date is 1952. S. O. code no. 23-2722. Contents: - Repeated loading and fatigue tests on D.H. 104 (Dove) wing and fin, by W.A.P. Fisher. (From Aircraft Engineering, Vol. 22, no. 256, p. 166, June 1950). - Shock-wave and boundary-layer phenomena near a flat surface, by A. Fage and R. F. Sargent. (From Proceedings of the Royal Society, A, Vol. 190, 1947). - Jet flow and its effects on aircraft, by H. B. Squire. (From Aircraft Engineering Vol. XXII, no. 253, March 1950). - Shielded hot-wire anemometer for low speeds, by L.F.G. Simmons. (From Journal of Scientific Instruments, Vol. 26, Dec 1949). - Economic value of increase of modulus of elasticity in aluminium alloys, by H. L. Cox and Mrs. M. J. Windle. (From Aircraft Engineering, Vol. XXI, no. 250, Dec 1949). - Notes on the opening behaviour and the opening forces of parachutes, by F. O'Hara. (From Journal of the Royal Aeronautical Society, Vol. 53, no. 467, Nov 1949). - Application of Mellin transforms to the summation of slowly convergent series, by G.G. Macfarlane. (From Philosophical Magazine, Ser. 7, Vol. XI, p. 188, Feb 1949). - Note on the time required to make a level speed measurement with a turbine-jet aircraft, by K. J. Lush (From Journal of the Royal Aeronautical Society, no. 478, Vol. 54, Oct 1950). - Longitudinal stability, speed and height, an examination of dynamic longitudinal stability in level flight, including the effects of compressibility and changes in atmospheric phenomena with height, by S. Neumark. (From Aircraft Engineering, Vol. XXII, no. 261, p. 323-334, Nov 1950). - Some developments of expansion methods for solving the flutter equations, by J. Williams. (From Aeronautical Quarterly, Vol. II, Nov 1950, p. 209-225). - Reheat factor in turbines and turbo-compressors, by J. Kestin. (From Aircraft Engineering, Vol. XXII, no. 262, Dec 1950, p. 361-367). - Steady circulatory flow about a circular cylinder with uniformly distributed suction at the surface, by J. H. Preston. (From Aeronautical Quarterly, Vol. I, Feb 1950).
1. Aeronautical research - Bibliography - Gt. Brit. 2. Aeronautical research - Abstracts - Gt. Brit. 3. ARC RM 2722.

Analysis of normal accelerations and airspeeds of one type of twin-engine transport airplane in commercial operations over a Northern transcontinental route, by Roy Steiner. U. S. National Advisory Committee for Aeronautics. Nov 1952. 23p graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108125

1. Airplanes, Transport - Acceleration 2. Airplanes, Transport - Speed 3. Gust loads 4. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 5. NACA TN 2833.

Corrections for lift, drag, and moment of an airfoil in a supersonic tunnel having a given static pressure gradient, by H. F. Ludloff and M. B. Friedman. U. S. National Advisory Committee for Aeronauticals. Dec 1952. 69p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108217

1. Flow, Supersonic - Theory 2. Flow, Supersonic - Perturbation potentials 3. Airfoils - Wind tunnel tests 4. Airfoils - Pressure distribution 5. Airfoils - Drag 6. Airfoils - Lift coefficients 7. Airfoils - Pitching moments 8. Equations, Differential 9. New York University, New York, N. Y. 10. NACA TN 2849.

Effect of a finite trailing-edge thickness on the drag of rectangular and delta wings at supersonic speeds by E. B. Klunker and Conrad Rennemann, Jr. U.S. National Advisory Committee for Aeronautics. Nov 1952. 26p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108081

1. Flow, Supersonic 2. Mach number - Effect 3. Wings, Rectangular - Aspect ratio 4. Wings, Rectangular - Drag 5. Wings, Triangular - Aspect ratio 6. Wings, Triangular - Drag 7. Airfoils - Thickness - Effect on drag 8. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 9. NACA TN 2828.

Harvard 4 flight trials, by D. E. Biden. Canada. Royal Canadian Air Force. Central Experimental and Proving Establishment, Rockcliffe, Canada. Nov 1952. 12p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108029

1. Harvard 4 (Airplane) 2. Airplanes - Flight tests - Canada 3. RCAF EPE 988.

Landing gear with twin tandem wheel units: Corning characteristics as determined by model tests, by J. W. Blinkhorn. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jul 1948. 7p photos, drawing, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 108061

For twin tandem units the wheel loading conditions which arise when aircraft are turned on the ground may be critical for the landing gear. To estimate the magnitude of these loads, cornering tests were made on a small-scale model of the main undercarriage unit proposed for the Brabazon I, Mk. II.

These tests showed that for zero turning radius, i.e., turning about the central vertical axis of the model undercarriage, the wheel side loads were almost equal to the vertical load multiplied by the coefficient of sliding friction between the tyres and the ground. The side loads rapidly decreased as the turning radius increased, and with the turning radius equal to three times the wheel side loads were only about half of those at zero turning radius. The severity of the design loads for turning on the ground will therefore be considerably reduced if it can be ensured that the centre of the minimum turning circle of the aircraft is a short distance outboard of either main undercarriage unit. Cover date is 1952. S. O. code no. 23-2668. ARC RM 2668.

Low-speed wind-tunnel tests of Fowler flaps, slats and nose flaps on a model of a jet aircraft with a 40 deg sweptback wing, by A. Spence. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1948. 18p drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 108064

This report presents the results of tests with Fowler flaps on a model of a single-jet aircraft with a 40 deg swept-back 10 per cent thick wing. Slats and nose flaps were also tested as means of delaying the tip stall. The maximum trimmed lift coefficient without flaps or slats was 1.055 ($R = 2.7 \times 10^6$). With half-span Fowler flaps (leaving a gap across the fuselage) and slats over the outer half of the span, this value was increased to 1.64, and there was adequate stability. Tests in which the spanwise extent of the nose flap was varied, indicated that about 50 per cent. wing semi-span per side was the optimum length of slat or nose flap for avoiding instability at the stall. Cover date is 1952. S. O. code no. 23-2752. ARC RM 2752.

Notes on the derivation of true air temperature from aircraft observations, by D. D. Clark. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1950. 8p graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108202

Cover date is 1952. C. P. no. 90. M.R.P. 604. S. O. code no. 23-9006-90.
1. Air - Temperature - Gt. Brit. 2. Aircraft, High altitude - Pressure distribution - Gt. Brit. 3. Air speed - Calculation - Gt. Brit. 4. Airplanes - Speed - Measurements - Gt. Brit. 5. Flying, High speed - Meteorology - Gt. Brit. 6. Meteorology - Observations - Gt. Brit. 7. ARC CP 90.

On the theory of slowly oscillating delta wings at supersonic speeds, by Sune B. Berndt. Flygtekniska Försöksanstalten (FFA), Stockholm. 1952. 20p diagrs, fold graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108142

To investigate the applicability of the quasi-stationary approximation (obtained by disregarding time derivatives in the differential equations but not in the boundary conditions), a method has been obtained by which the lift distribution for slow harmonic oscillations can be calculated. The method essentially is to expand the linearized perturbation potential into a series of powers of the streamwise distance from the apex multiplied by the frequency. In the general case the wing is permitted to distort, and the problem is reduced to the solution of a series of linear differential equations of second order with two independent variables, the equations being of the form obtained for conical flow. The quasi-stationary approximation is seen to be satisfactory only for oscillations which maintain the chords parallel to the undisturbed flow. The method is applied to the narrow rigid triangular wing, for which the first approximation (already known) can be expressed by well-established steady solutions. FFA no. 43.

Tests in the compressed air tunnel on the aerofoils NACA 0015 and NACA 0030 with and without split flap and on other aerofoils of various thicknesses with a split flap, by R. Jones. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1940. 32p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.90. PB 108059

Cover date is 1952. S. O. code no. 23-2584.
1. Airfoils - Wind tunnel tests - Gt. Brit. 2. Wing flaps, Split - Gt. Brit. 3. NACA 0015 (Airfoils) - Gt. Brit. 4. NACA 0030 (Airfoils) - Gt. Brit. 5. Flaps, Aircraft - Wind tunnel tests - Gt. Brit. 6. ARC RM 2584.

Tests in the compressed air tunnel on two aerofoil sections having a large scale effect on C_L max at a critical Reynolds number, by C. Salter, Miss H. M. Lee, Miss R. C. Owen. Gt. Brit. Ministry of Supply. Aeronautical Research Council. 1952. 21p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 108085

S. O. code no. 23-9006-92.
1. Airfoils - Wind tunnel tests - Gt. Brit. 2. Airfoils - Drag - Gt. Brit. 3. Airfoils - Lift - Gt. Brit. 4. Airfoils - Pitching moments - Gt. Brit. 5. Reynolds number - Effect - Gt. Brit. 6. Gt. Brit. National Physical Laboratory. Aerodynamics Division 7. ARC CP 92.

Span load distributions resulting from constant angle of attack, steady rolling velocity, stead pitching velocity, and constant vertical acceleration for tapered sweptback wings with streamwise tips, subsonic leading edges and supersonic trailing edges, by Margery E. Hannah and Kenneth Margolis. U. S. National Advisory Committee for Aeronautics. Dec 1952. 221p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108139

1. Wings, Sweptback - Span load distribution 2. Wings, Sweptback - Aspect ratio 3. Mach number - Effect 4. Flow, Supersonic - Theory 5. U. S.

Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA TN 2831.

Instruments

Auxiliary equipment and techniques for adapting the constant-temperature hot-wire anemometer to specific problems in air-flow measurements, by James C. Laurence and L. Gene Landes. U. S. National Advisory Committee for Aeronautics. Dec 1952. 77p diagrs, photos, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108140

1. Anemometers, Hot wire 2. Air flow - Measurements 3. Heat - Transference - Aerodynamic 4. Flow, Turbulent - Measurements 5. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 6. NACA TN 2843.

Engines and Propellers

Calorimetric determination of constant-pressure specific heats of carbon dioxide at elevated pressures and temperatures, by Virgil E. Schrock. U. S. National Advisory Committee for Aeronautics. Dec 1952. 46p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108175

1. Engines, Turbine propeller - Fuel systems 2. Carbon dioxide - Thermodynamic properties 3. Combustion - Research 4. Fuels - Combustion - Effect of temperature 5. California. University, Berkeley, Calif. 6. NACA TN 2838.

Comparative flutter tests on two, three, four and five-blade propellers, by H. G. Ewing, J. Kettlewell and D. R. Gaukroger. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1948. 8p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108060

This report describes comparative flutter tests on two, three, four- and five-blade Duralumin propellers with the same blade design. The tests were made on the No. 3 spinning tower, Royal Aircraft Establishment. Strain-gauges were used for determining the vibratory stresses and the phase relations between the blades. A wide range of blade angles above and below the stalling region was explored. Stalling flutter was the only form encountered. The phase relation of the blades was found to be dependent on number of blades and speed of rotation, and to influence the amplitude of the vibratory stresses. It is shown that no direct comparison of the flutter characteristics of the two, three, four and five-blade propellers can be made. Cover date is 1952. S. O. code no. 23-2634. ARC RM 2634.

Effect of induced velocity variation on helicopter rotor damping in pitch or roll, by G. J. Sissingh. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1951. 16p diagr, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108205

Cover date is 1952. C. P. no. 101. Technical note no. Aero 2132. S. O. code no. 23-9006-101. 1. Pitching moment coefficients - Gt. Brit. 2. Damping derivatives - Coefficients - Gt. Brit. 3. Helicopters - Rotors - Damping - Tests - Gt. Brit. 4. Helicopters - Rotors - Pitching moments - Gt. Brit. 5. Helicopters - Speed - Gt. Brit. 6. ARC CP 101.

Investigation of 75-millimeter-bore deep-groove ball bearings under radial load at high speeds. I: Oil-flow studies, by Zolton N. Nemeth, E. Fred Macks and William J. Anderson. U. S. National Advisory Committee for Aeronautics. Dec 1952. 30p diagr, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108127

1. Ball bearings - Lubrication 2. Lubrication - Tests 3. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 4. NACA TN 2841.

Project Squid. Semi-annual progress report. U. S. Office of Naval Research and U. S. Office of Air Research. Apr 1951. 184p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.75, Photostat $23.75. PB 107680

1. Jet propulsion - Research 2. Jet engines - Research 3. Heat - Transference 4. Flame - Kinetics 5. Combustion - Spectroscopy 6. U. S. Office of Air Research, Wright-Patterson Air Force Base, Dayton, Ohio.

Radiant-interchange configuration factors, by D. C. Hamilton and W. R. Morgan. U. S. National Advisory Committee for Aeronautics. Dec 1952. 110p photos, diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108215

1. Heat - Transference - Aerodynamics 2. Heat - Transference - Theory 3. Equations, Integral 4. Configuration factor equations 5. Purdue University, Lafayette, Ind. 6. NACA TN 2836.

Training and Training Devices

Aspects of noncommissioned officer leadership, by John V. Moore and Robert G. Smith, Jr. U. S. Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Ill. Oct 1952. 14p tables

Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108226

Project no. 507-009-0001.
1. Leadership 2. Tests, Officer qualification 3. AAF HRRC TR 52-3.

Critical requirements of pilot instructors, by Richard L. Krumm. U. S. Air Training Command. Human Resources Research Center. Pilot Training Research Laboratory, Goodfellow Air Force Base, Texas. Sep 1952. 22p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108225

Contract no. AF33(038)-23183. Project no. 508-016-0003.
1. Instructors, Aviation - Evaluation 2. Instructors, Aviation - Psychological tests 3. AAF HRRC TR 52-1.

Method of establishing minimum qualifying scores for entrance to Air Force technical schools, by Mary Agnes Gordon. U. S. Air Training Command. Human Resources Research Center. Personnel Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Nov 1952. 11p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108227

Project no. 503-001-0001.
1. Pilots, Air - Training 2. Personnel, Flying - Selection 3. Ability tests 4. AAF HRRC TR 52-4.

Aerodynamics

Dvizhenie tsilindra pod poverkhnostyu trayzheloi zhidkosti (Motion of a cylinder under a heavy fluid), by L. N. Sretensky. Nov 1952. 37p graph Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108079

Translated from Central Aero-Hydrodynamical Institute. Report no. 346, 1938, p. 3-27.
1. Hydrodynamics - Theory - Russia 2. Mathematical equations and solutions - Russia 3. Equations of motion - Russia 4. U. S. National Advisory Committee for Aeronautics 5. U.S.S.R. Central Aero - Hydrodynamical Institute 6. NACA TM 1335.

Theoretical and experimental investigation of the effects of yaw on pressures, forces, and moments during seaplane landing and planning, by Robert F. Smiley. U. S. National Advisory Committee for Aeronautics. Nov 1952. 100p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108080

1. Hydrodynamics - Theory 2. Seaplanes - Hulls - Dead rise 3. Seaplanes - Hulls - Impact pressures 4. Loads, Landing - Impact 5. Planing surfaces - Hydrodynamics 6. Rolling moments 7. Yawing moments 8. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 9. NACA TN 2817.

Theoretical study of the transonic lift of a double-wedge profile with detached bow wave, by Walter G. Vincenti and Cleo B. Wagoner. U. S. National Advisory Committee for Aeronautics. Dec 1952. 63p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108174

Portions of this work were reported at the eighth International Congress on Theoretical and Applied Mechanics, Istanbul, Turkey, August 20-28, 1952.
1. Wing profiles - Lift 2. Wing profiles - High speed tests 3. Wings - Angle of attack 4. Flow, Transonic - Theory 5. Flow, Mixed - Theory 6. Mach number - Effect 7. Mathematics, Applied - Aerodynamics 8. U. S. Ames Aeronautical Laboratory, Moffett Field, Calif. 9. International Congress on Theoretical and Applied Mechanics, 8th,1952 10. NACA TN 2832.

Land Transportation

Semitrailer, 7½-ton, 2-wheel, refrigerator, lightweight (Brown model QST-120 without refrigerating unit). U. S. Army and U. S. Air Force. May 1952. 82p photos, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 108281

Basic issue.
1. Trailers, Semi - Refrigeration systems - Maintenance and repair 2. Trailers, Semi - Refrigeration systems - Operation 3. Refrigerators, Mobile - Maintenance and repair 4. Refrigerators, Mobile - Operation 5. QST-120 (Semitrailer refrigerator) 6. WD TM 10-1365 7. AAF TO 19-75ACD-9.

Marine Transportation

L.C.E. instruction and parts books. Model 6051, series 71, quad six-cylinder Diesel engine. Operation and maintenance manual and parts book. U.S. Bureau of Ships. Apr 1944. 436f photos, drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $57.00. PB 108333

1. Engines, Diesel - Maintenance and repair 2. Engines, Diesel - Parts 3. 6051 (Diesel engine) 4. General Motors Corp. Detroit Diesel Engine Div., Detroit, Mich. 5. Micro NAVSHIPS D6714.

Instructions for the care and operation of General Motors Diesel engines models 12 & 16-258, main engines for SS167, SS168, SM1. U. S. Bureau of Ships. Apr 1944. 112f photos, drawings Available from Library of Congress, Publication Board

Project, Washington 25, D. C. Microfilm $4.75, Enlargement Print $16.25. PB 108479

1. Engines, Diesel - Marine - Maintenance and repair 2. 16-258 (Diesel engine) 3. 12 (Diesel engine) 4. Nautilus (Ship) - Engines 5. Micro NAVSHIPS D-6800.

Investigation of wave effects produced by a thin body, TMB Model 4125, by Georg P. Weinblum, Janet J. Kendrick, and M. Allison Todd. U. S. David W. Taylor Model Basin, Washington, D. C. Nov 1952. 21p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available free from David W. Taylor Model Basin, Washington 25, D. C. PB 108172

A thin friction body is used to check experimentally Michell's wave resistance theory. The wave resistance experienced by the model and the wave profiles along the hull are calculated. These theoretical values are compared with the results of the experiments. DWTMB 840.

Main engine parts list for USS Nautilus, SS168. U. S. Bureau of Ships. Apr 1944. 89f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Enlargement Print $12.50. PB 108478

1. Engines, Diesel - Marine - Parts 2. Nautilus (Ship) - Engines 3. SS 168 (Ship) - Engines 4. Micro NAVSHIPS D-6799.

LC.E. instruction and parts books. Maintenance manual and parts book, two-cylinder, two-cycle Diesel engine and 20 k.w. generator set, model 2003. U. S. Bureau of Ships. Apr 1944. 180f photos, drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.50, Enlargement Print $23.75. PB 108332

1. Engines, Diesel - Maintenance and repair 2. Engines, Diesel - Parts 3. Generators - Maintenance and repair 4. Generators - Parts 5. General Motors Corp. Detroit Diesel Engine Div., Detroit, Mich. 6. Micro NAVSHIPS D6696.

MISCELLANEOUS

Cost savings through standardization, simplification, specialization in electrically operated household appliances. U. S. Bureau of Labor Statistics. Nov 1952. 174p drawings, tables Available free from Bureau of Labor Statistics, Division of Productivity and Technological Development, Washington 25, D. C. PB 108351

Prepared under the direction of Milton Lipton.
1. Industry - Organization, control, etc. 2. Electrical equipment, Household - Cost of production 3. Electrical equipment industry.

Report on research activities in the Federal Republic of Germany. Findings and recommendations of an Industrial Research Mission organized by the Economic Cooperation in collaboration with the Ministry of Economy of the Federal Republic of Germany, by Harold Vagtborg, Robert R. Adams, Hugh Green Buhrman, William A. Casler, Jesse E. Hobson, Maurice Holland, Calvin O. Williams. Industrial Research Mission. Aug 1951. 50p diagr, map Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.25. PB 111082

1. Industrial research - Germany 2. U. S. Economic Cooperation Administration 3. Germany. Reichswirtschaftsministerium.

Retailing. Report of a productivity team representing British retailing which visited the United States of America in 1952. Anglo-American Council on Productivity. Nov 1952. 102p photos, drawings, map, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.90. PB 106463

1. Retail trade.

Selected operating data for industrial research laboratories, a preliminary report for cooperators in the research control survey, by Robert N. Anthony. Harvard University. Graduate School of Business Administration. Div. of Research. 1951. 51p tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108350

1. Laboratories, Industrial research.

PATENTS

Chemicals and Allied Products

Perfectionnements aux parois anti-buee (Improvements in anti-fogging partitions) Patent no. 835187. Translated by Linton C. Stevens. France. Ministère du Commerce et de l'Industrie. Administration de la Propriété Industrielle. Mar 1952. 8p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107451

Patent applied for 30 Aug 1937; patent granted 19 Sep 1938; patent abstract published 14 Dec 1948.
1. Compounds, Anti-fogging - Patents - France 2. Patents - France - No. 835187 3. NAVSHIPS T455 4. STS 127.

Die anstrichmittel und ihre verarbeitung. (Coatings and their utilization), by N. Kroll and G. Rölz. Sep 1947. 31p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. Translation of PB 14575. PB 14575t

Diesel locomotives. Report of a visit to the U. S. A. in 1950 of a productivity team representing the Diesel locomotive industry. Anglo-American Council on Productivity. Nov 1950. 78p photos, map, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 106410

Education for management. Report of a visit to the U. S. A. in 1951 of a specialist team concerned with education for management. Anglo-American Council on Productivity. Nov 1951. 105p photos, fold map, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 106432

Electron microscopy of metal samples by replica techniques, by L. S. Birks and R. T. Seal. U. S. Naval Research Laboratory. Jun 1950. 12p photos, (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 102007

1. NRL R 3693.

Erfahrungen über homo- und heteropolymerisation. (Experience with homo- and heteropolymerization), by Herr Voss and Herr Starck. Nov 1947. 6p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 32928t

Translation of Micro FIAT C 71, Frames 1147-1158 (PB 32928).

Further research on the hydrolube fluid, by J. E. Brophy, V. G. Fitzsimmons, J. G. O'Rear, T. R. Price and W. A. Zisman. U. S. Naval Research Laboratory, Washington, D. C. Sep 1949. 45p photos, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. 1. NRL R 3545. PB 110129

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S. O. code no. 51-283-25*

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